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FLORA

OF

NORTH AMERICA.

Torrey + Gray

EXOGENOUS OR DICOTYLEDONOUS PLANTS

CONTINUED.

Section II. MONOPETALOUS EXOGENOUS PLANTS.

Floral envelopes consisting of both calyx and corolla; the latter composed of united petals* (monopetalous or gamopetalous).

I. *Calyx adherent to the ovary* (*ovary inferior*).†

CONSPECTUS OF THE ORDERS IN THIS DIVISION.

* *Ovary with 2 or more cells, and 1–many ovules in each, or by abortion 1-celled. Stamens inserted upon the corolla. Seeds albuminous. Leaves opposite.*

Stipules none. — 72. Caprifoliaceæ.
Stipules interpetiolar, or simulating the leaves. — 73. Rubiaceæ.
Stipules ? 1 to 3 on each side, entirely similar to the leaves and forming with them a verticil. — *Subord.* Stellatæ.
Stipules between the petioles.
Ovary coherent. — *Subord.* Cinchoneæ.
Ovary nearly free from the calyx. — *Subord.* Loganieæ.

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* A few Ericaceæ, a portion of Plumbaginaceæ, some Aquifoliaceæ, &c., are polypetalous, or nearly so.

† In a few Rubiaceæ the ovary is partly, and in the suborder Loganieæ completely, free from the calyx; in some Dipsaceæ the apex of the ovary is coherent with the calyx, while the lower portion is free. On the other hand, one or two genera with an adherent calyx, such as Vaccinium, Hopea, and Halesia, belong to orders which have for the most part a free ovary.

* * *Ovary with a single cell and a solitary ovule, or rarely with 3 cells, two of which are empty. Seeds with little or no albumen. Fruit indehiscent.*

Stamens distinct. Seed suspended.
Flowers not in involucrate heads. Albumen none. 74. VALERIANACEÆ.
Heads dense, involucrate. Seeds albuminous. 75. DIPSACEÆ.
Stamens syngenesious. Heads involucrate. 76. COMPOSITÆ.

* * * *Ovary with one or several cells, and numerous ovules. Stamens inserted with the corolla. Fruit capsular. Seeds mostly albuminous.*

Corolla irregular. Stamens united. 77. LOBELIACEÆ.
Corolla regular. Stamens mostly distinct. 78. CAMPANULACEÆ.
Corolla regular, 5-parted. Anthers sessile. *Subord.* PONGATIEÆ.

ORDER LXXII. CAPRIFOLIACEÆ. *Juss.; DC.*

Tube of the calyx adherent to the ovary; the limb 5- (rarely 4-) cleft or toothed. Corolla tubular, or sometimes rotate; the lobes imbricate in æstivation. Stamens equal in number and alternate with the lobes of the corolla (or rarely one of them deficient), and inserted into the tube: anthers introrse, versatile. Ovary 3- (rarely 4–5-) celled, with 1–several pendulous ovules in each cell: style filiform, with a somewhat capitate stigma; or wanting, and the oblong stigmas 3–5. Fruit baccate, fleshy, or sometimes dry (rarely capsular), often 1-celled by abortion. Seeds anatropous. Embryo in the axis of fleshy albumen.—Shrubs, or rarely herbaceous plants, with opposite exstipulate leaves. Inflorescence various.

TRIBE I. LONICEREÆ. *R. Br.*

Corolla tubular; the limb sometimes irregular. Style filiform. Raphe on the outer side of the ovule!

Subtribe 1. CAPRIFOLIÆ.—Fruit baccate, or sometimes nearly dry. Testa of the seed crustaceous or coriaceous.

1. LINNÆA. *Gronov. in Linn. gen. no.* 774; *DC. prodr.* 4. *p.* 340.

Calyx-tube ovate; the segments of the 5-parted limb lanceolate-subulate, deciduous. Corolla turbinate-campanulate, somewhat equally 5-lobed. Stamens 4, didynamous, included, inserted towards the base of the corolla. Ovary 3-celled; two of the cells with several abortive ovules; the third with a single fertile ovule suspended from the summit. Style slightly exserted: stigma capitate. Fruit ovoid-globose, dry and indehiscent, 3-celled (the two sterile cells smaller), 1-seeded.—A creeping or trailing evergreen herb (indigenous to the northern parts of the old and new world), somewhat hairy;

with broadly oval sparingly crenate-toothed leaves, abruptly narrowed into a petiole. Peduncles filiform, terminating the ascending branches, bearing two pedicellate (minutely bibracteolate) nodding flowers. Corolla purplish-rose-color or nearly white.

L. borealis (Gronov.)—*Linn.! fl. Lapp. p.* 214, *t.* 12, *f.* 4, *fl. Suec. ed.* 2. *p.* 219 (*ic*), *& spec.* 2. *p.* 631; *Fl. Dan. t.* 3; *Schkuhr, handb. t.* 176; *Lam. ill. t.* 536; *Engl. bot. t.* 1297; *Michx.! fl.* 1. *p.* 87; *Wahl. fl. Lapp. p.* 170, *t.* 9, *f.* 3; *Pursh! fl.* 2. *p.* 413; *Torr! fl.* 1. *p.* 175; *Bigel.! fl. Bost. ed.* 2. *p.* 241; *Richards. appx. Frankl. journ. ed.* 2. *p.* 25; *DC.! l. c.*; *Hook.!* (*fl. Lond. n. ser. t.* 199) *fl. Bor.-Am.* 1. *p.* 285.

Moist mossy woods, usually under the shade of evergreens, from the Arctic Circle to the New England States! New York! New Jersey! (in a cedar swamp near New Durham, *Mr. L. Menard*,) and the mountains of Pennsylvania; and from Newfoundland! and Labrador! to the Rocky Mountains! Oregon! Unalaschka and Kotzebue's Sound! June–July.—Stems filiform, sending up numerous short branches. Leaves about half an inch long, sparsely hispid. Flowers fragrant; the slender pedicels, and particularly the calyx-tube and the appressed bracts, clothed with glandular hairs. Corolla hairy inside.—This unpretending and beautiful plant, so interesting from its association with the name of *Linnæus*, is as widely dispersed throughout the northern portion of the new, as of the old world.

2. SYMPHORICARPUS. *Dill. Elth. p.* 371. *t.* 278; *DC. prodr.* 4. *p.* 338.

Symphoria, *Pers.*

Calyx-tube globose; the limb 4–5-toothed, persistent. Corolla infundibuliform or campanulate, somewhat regularly 4–5-lobed. Stamens 4–5, inserted into the throat of the corolla. Ovary 4-celled; two of the cells with several abortive ovules; the two others (opposite) each with a single fertile ovule pendulous from the summit. Stigma capitate. Fruit a globose or ovoid berry, 4-celled; two opposite cells 1-seeded, the others empty. Seeds bony.—Small branching shrubs (natives of North America and Mexico); with oval entire leaves on short petioles. Flowers small, bibracteolate, in short axillary clusters or terminal spikes. Corolla rose-color or white. Berries red or white.

1. *S. racemosus* (Michx.): spikes terminal, loose, interrupted, often somewhat leafy; corolla campanulate, densely bearded inside; style (glabrous) and stamens included.—*Michx.! fl.* 1. *p.* 107; *DC.! l. c.*; *Hook.! fl. Bor.-Am.* 1. *p.* 285. Symphoria racemosa, *Pers. syn.* 1. *p.* 214; *Pursh.! fl.* 1. *p.* 169; *Bot. mag. t.* 2211; *Lodd. bot. cab. t.* 230; *Bart. fl. Amer. Sept.* 1. *t.* 19; *Torr.! fl.* 1. *p.* 246. S. elongata & heterophylla, *Presl, in herb. Hænke?* ex *DC.*

Rocky banks of rivers (mostly on limestone), Upper Canada! Western part of New York! and Western States! to Oregon! and the North-West Coast! California, fide *Hook. & Arn. bot. Beechey*. Common also in cultivation. July–Aug.—A nearly glabrous shrub, 2–3 feet high, often surculose. Leaves oval or oblong, 1–2 inches long, sometimes a little pubescent; the margin often undulate. Spikes usually pedunculate; the flowers opposite. Corolla about 3 lines long, rose-color. Berries globose and roundish-obovate, very white, opaque when ripe, often half an inch in diameter.—*Snow-berry.*

2. *S. occidentalis* (R. Brown): spikes dense, terminal and axillary, nodding; corolla infundibuliform-campanulate, densely bearded within: stamens and (somewhat bearded) style exserted.—*R. Br. in Richards.! appx. Frankl. journ. ed.* 2. *p.* 6; *Hook.! l. c.*

Woody country of British America (*Richardson!*) and Saskatchawan (*Drummond!*) to the sources of the Mississippi, *Dr. Houghton!* and near Fort Gratiot, Michigan, *Dr. Pitcher!* Also Oregon, *Douglas.* (*Hook.*) June–July.—Shrub 1–4 feet high. Leaves ovate, 1–3 inches long, somewhat hairy above, pubescent underneath, rather obtuse; the petioles about one-third of an inch long. Spikes nearly sessile. Calyx-teeth minutely ciliate. Corolla purplish and white, larger than in the preceding, and the border more spreading. "Berries white, remaining on the plant during the autumn and winter." *Dr. Pitcher.*—*Wolf-Berry* of the Canadians.

3. *S. vulgaris* (Michx.): spikes axillary, almost sessile, capitate-glomerate; lobes of the campanulate corolla somewhat glabrous inside; stamens and (bearded) style included.—*Michx.! fl.* 1. *p.* 106; *DC.! l. c.* S. parviflora, *Desf. cat. hort. Par.* Lonicera Symphoricarpos, *Linn.! spec.* 1. *p.* 175. Symphoria conglomerata, *Pers. syn.* 1. *p.* 214. S. glomerata, *Pursh, l. c.; Nutt.! gen.* 1. *p.* 139; *Torr.! fl.* 1. *p.* 246.

Banks of rivers, Pennsylvania (*Muhlenberg*) Virginia! and mountains of the Southern States! to the Upper Missouri (*Nuttall! Dr. James!*) and Texas, *Drummond!* July–Sept.—Shrub 2–3 feet high, with erect purplish pubescent branches. Leaves about an inch and a half long, roundish-oval or ovate, mucronate, slightly hairy above, tomentose-pubescent beneath. Spikes much shorter than the leaves. Corolla 2 lines long, greenish-red; the tube bearded inside. Berries about the size of a small currant, dark red (bluish-purple, *Nutt.*).—*Indian Currant.*

4. *S. mollis* (Nutt.! mss.): "racemes very short, towards the summit of the branches, nearly sessile; corolla glabrous inside; calyx conspicuous; leaves oval or ovate, obtuse, pubescent, almost hoary and softly villous underneath.

"St. Barbara, California; common.—Nearly allied to the preceding; but with smaller leaves, larger flowers and a conspicuous calyx. Flowers reddish-white." *Nuttall.*

5. *S. ciliatus* (Nutt. mss.): "spikes very short, towards the summit of the branchlets; the terminal one pedunculate; corolla glabrous; leaves roundish-ovate, obtuse, pubescent underneath, ciliate.

"St. Barbara, California.—Flowers very small, reddish.—Considerably allied to S. vulgaris; but differs in the leaves being rounded at the base and ciliate." *Nuttall.*

3. LONICERA. *Linn.; Desf. fl. Atl.* 1. *p.* 183; *DC. prodr.* 4. *p.* 330.

Xylosteon, Caprifolium, Chamæcerasus, & Periclymenum, *Tourn.*

Calyx-tube ovoid or subglobose; the limb short, 5-toothed. Corolla tubular, infundibuliform or campanulate, often gibbous at the base; the limb 5-cleft, nearly regular, or ringent. Stamens 5. Ovary 2–3-celled, with several pendulous ovules in each cell. Stigma capitate. Berry 2–3-celled, or by obliteration 1-celled, few-seeded. Seeds crustaceous.—Climbing or erect shrubs. Leaves entire, often connate. Flowers axillary and pedunculate, or in sessile whorls or heads, often fragrant.—*Honeysuckle.*

§ 1. *Stem climbing: leaves often connate: flowers sessile, in verticillate-capitate clusters: berries never connate, often* 1*-celled when mature, crowned with the persistent limb of the calyx.*—CAPRIFOLIUM, Juss.

* *Corolla nearly regular.* (Periclymenum, *Tourn.*)

1. *L. sempervirens* (Ait.): leaves oblong and narrowly elliptical, glabrous above, glaucous and slightly pubescent underneath; the lower ones somewhat petioled; the upper connate-perfoliate; flowers in somewhat distant whorls; corolla trumpet-shaped, with short and broad nearly equal lobes.—*Ait. Kew.* (*ed.* 1) 1. *p.* 230; *Walt. Car. p.* 131; *Bot. mag. t.* 781, & 1753; *Bot. reg. t.* 556; *Torr.! fl.* 1. *p.* 244; *DC. prodr.* 4. *p.* 432. Caprifolium sempervirens, *Michx.! fl.* 1. *p.* 105; *Pursh, fl.* 1. *p.* 160; *Ell. sk.* 1. *p.* 271.

Borders of swamps, Island of New York! to Georgia! Florida! and Louisiana! April–Oct. (in the Southern States.)—Stem twining over shrubs, or sometimes prostrate. Leaves 1½ to nearly 3 inches long; the upper 1–2 inches wide; the lower sometimes almost lanceolate. Peduncle 1–2 inches long: whorls 4–6-flowered. Flowers showy, inodorous; the corolla almost 2 inches long, slightly ventricose above, tapering gradually to the base, scarlet externally, yellowish within. Stamens a little exserted. Berries scarlet, about 4-seeded.—The wild plant, in the neighborhood of New York, remains in flower only a few weeks (May–June), and the leaves are deciduous; but in gardens, it blossoms nearly throughout the season, and the leaves are somewhat perennial, as is the case with the native plant in the Southern States.—*Scarlet Honeysuckle. Trumpet-Honeysuckle.*

2. *L. ciliosa* (Poir.): leaves ovate, glaucous beneath, conspicuously ciliate, or sessile and somewhat clasping; the uppermost connate-perfoliate; whorls of the subsessile spike approximate-capitate; corolla (deep yellow) somewhat equal; the tube hirsute, ventricose in the middle. *Pursh.* [teeth of the calyx conspicuous, *Nutt.! mss.*]—*Poir. dict.* 5. *p.* 612; *DC. prodr.* 4. *p.* 333. Caprifolium ciliosum, *Pursh! fl.* 1. *p.* 160.

Oregon; on the Kooskoosky, *Lewis!* and along the Oregon from the Falls to the sea, *Nuttall!*—We have seen the original specimens in Mr. Lambert's herbarium, but have not the means of completing the diagnosis between this and the following species. The flowers are bright yellow, according to Mr. Nuttall; who alone seems to have met with the plant, subsequently to Lewis.

3. *L. occidentalis* (Hook.): twining; leaves oval, nearly sessile, glabrous, ciliate, glaucous underneath; upper ones connate-perfoliate; flowers in verticillate heads; corolla (orange-red) glabrous; the tube elongated, gibbously inflated above the base; limb nearly equal; stamens somewhat included. *Hook. fl. Bor.-Am.* 1. *p.* 282. Caprifolium occidentale, *Lindl. bot. reg. t.* 1457.

About Fort Vancouver on the Oregon, *Douglas.*—This species is considered a great acquisition to the English gardens; the flowers are said to be full orange-red, and longer than in L. parviflora, hirsuta, &c. We do not find that Mr. Nuttall met with it, so as to compare it with the true L. ciliosa, to which it is doubtless allied.

* * *Corolla ringent; the upper lip* 4*-lobed or* 4*-toothed.* (Caprifolium, *Tourn.*)

† Natives of the United States and Canada.

4. *L. grata* (Ait.): stem twining; leaves obovate, glabrous, glaucous beneath; the lower ones contracted at the base; the two or three upper pairs connate-perfoliate; flowers (large) verticillate in the axils of the upper leaves or leaf-like connate bracts; tube of the corolla long and slender, not gibbous;

filaments glabrous.—*Ait. l. c.; Willd. spec.* 1. *p.* 984; *DC. prodr.* 4. *p.* 332; *Darlingt.! fl. Cest. p.* 159. Caprifolium gratum, *Pursh, fl.* 1. *p.* 161; *Ell. sk.* 1. *p.* 152.

Moist rocky woodlands, Pennsylvania (*Darlington!*) to Western Louisiana, *Dr. Hale!* "Mountains, New York to Carolina," *Pursh.* May.—"Stem 10 to 15 or 20 feet long, twining, or trailing unless supported; the young branches often quite pilose." *Darlington.* Leaves about 2 inches long, very obtuse, or with a short blunt point. Flowers about 6 in each whorl, very fragrant: the smooth corolla an inch and a half long, externally red or purplish; the limb (large) at first nearly white, soon turning to tawny yellow. Stamens exserted. Berries orange-red.—Very near the cultivated L. Caprifolium.

5. *L. albiflora*: twining or trailing; leaves (small and rather crowded) ovate, glabrous, glaucous beneath; the upper pair connate-perfoliate; the others distinct, sessile; flowers in small sessile heads; tube of the glabrous corolla slender, not gibbous; filaments glabrous.

Prairies near Fort Towson, on the Arkansas, *Dr. Leavenworth!*—Climbing over bushes and small trees. Leaves less than an inch long, rather rigid. Corolla "white," about three-fourths of an inch long; the lower lip oblong, scarcely half the length of the slender tube. Stamens somewhat exserted.—Apparently a very distinct species: the corolla, in shape, resembles that of L. grata.

6. *L. flava* (Sims): glabrous and somewhat glaucous; stem scarcely twining; leaves ovate, obovate, or oval, with a narrow cartilaginous margin; the upper pairs connate-perfoliate; the lowest distinct; flowers in small heads or approximate whorls; tube of the glabrous corolla slender, not gibbous; filaments glabrous.—*Sims, bot. mag. t.* 1318; *Torr. fl.* 1. *p.* 243; *DC. l. c.* Caprifolium Fraseri, *Pursh! fl.* 1. *p.* 160. C. flavum, *Ell. sk.* 1. *p.* 271.

β. more glaucous; the lower leaves abruptly narrowed at the base; tube of the corolla rather shorter and stouter.

Rocky banks of rivers, Cattskill Mountains, New York, *Pursh*; and Paris Mountains, S. Carolina, *Fraser.* Upper districts of Georgia, *Dr. Boykin!* *β.* Banks of the Scioto above Columbus, Ohio, *Mr. Sullivant!* Milwaukie, Wisconsin, *Mr. Lapham!* June–July.—Leaves 1½ to nearly 3 inches long, very glabrous above, glaucous and often with an extremely minute and soft whitish caducous pubescence beneath, obtuse, or with a blunt mucronate point. Flowers 8–12, in a subsessile or somewhat pedunculate head, or sometimes in two or three verticillate clusters, fragrant. Corolla bright yellow, an inch or rather more long (in *β.* less than an inch); the tube much longer than the somewhat ventricose limb, very slightly dilated near the base, but not gibbous; the lower lip narrowly oblong; the upper 4-lobed. Stamens exserted.—A beautiful species, which has long been cultivated in the European gardens.

7. *L. hirsuta* (Eaton): stem mostly twining; leaves (pale green, not shining) broadly oval, very veiny, ciliate, somewhat hairy above, softly villous beneath; the upper pair connate-perfoliate, often nearly glabrous; the others frequently petioled; peduncles mostly three together; the flowers in approximate capitate whorls; tube of the corolla viscid-pubescent, rather slender, slightly gibbous at the base; filaments sparsely hairy towards the base.—*Eaton! man. bot. ed.* 3. *p.* 341; *Torr.! fl.* 1. *p.* 242; *Bigel. fl. Bost. ed.* 2. *p.* 83; *Hook.! bot. mag. t.* 3163, & *fl. Bor.-Am.* 1. *p.* 282. L. villosa, *Muhl. cat. p.* 22, not of *DC.* L. pubescens, *Sweet, hort. Brit. p.* 194; *DC.! prodr.* 4. *p.* 332. L. Goldii, *Spreng. syst.* 1. *p.* 758. Caprifolium pubescens, *Goldie, in Edinb. phil. jour.* (1822) 6. *p.* 323; *Hook. exot. fl. t.* 27.

Rocky banks and margin of thickets, in damp soil, Canada! and Michigan! (around Lake Huron and Lake Superior!) and in the northern parts of New York! and the New England States! June–July.—Stem often twining to the height of 15–30 feet, with somewhat pubescent branches. Leaves 3–4 inches long, and 2–3 broad, membranaceous, conspicuously veiny, often somewhat rugose, sprinkled with scattered hairs above (some of which are usually a little glandular or viscid), conspicuously ciliate, often abruptly acute or slightly pointed at the base and apex; the upper surface nearly glabrous when old. Peduncles and even the ovaries often covered with a minute viscid or glandular pubescence, like that of the corolla. Flowers numerous, sulphur-yellow. Corolla hairy inside; the tube 6–8 lines long; the limb large and much expanded. Stamens and style exserted; the latter, like the filaments, more or less hairy below, sometimes hirsute. Berries orange, 3–5-seeded.

8. *L. parviflora* (Lam.): glabrous; stem trailing or twining; leaves elliptical or oblong, smooth, shining above, very glaucous beneath, with a slight often undulate cartilaginous margin; the upper pair connate-perfoliate; the others sessile and mostly somewhat connate; flowers in a more or less pedunculate head or 2–3 closely approximate whorls; corolla short, glabrous externally, gibbous at the base; filaments somewhat hairy below.—*Lam. dict.* 1. *p.* 728; *Torr.! fl.* 1. *p.* 245; *Bigel. fl. Bost. ed.* 2. *p.* 87; *DC.! prodr.* 4. *p.* 332; *Hook. fl. Bor.-Am.* 1. *p.* 282; *Darlingt.! fl. Cest. p.* 158. L. dioica, *Linn. syst.* (*ed.* 13) *p.* 181; *Ait. Kew.* (*ed.* 1) 1. *p.* 130; *Bot. reg. t.* 138. "L. media, *Murr. in comm. Gœtt.* (1776) *p.* 28, *t.* 3." Caprifolium glaucum, *Mœnch, meth. p.* 502. C. bracteosum, *Michx.! fl.* 1. *p.* 105. C. parviflorum, *Pursh! fl.* 1. *p.* 161. C. dioicum, *Rœm. & Schult. syst.* 5. *p.* 260.

β.? leaves pubescent or even somewhat villous-tomentose beneath: the lower ones distinct, sessile or slightly petioled; corolla pubescent.—L. parviflora *β. Hook. l. c.* L. Douglasii, *DC. l. c.* Caprifolium Douglasii, *Lindl. in hort. trans.* 7. *p.* 244. C. parviflorum, *Richards. appx. Frankl. journ. ed.* 2. *p.* 6, ex *Hook.*

Rocky banks of rivers, &c. Canada! (from Hudson's Bay to the Rocky Mountains, *a.* & *β. Hook.*) and from the New England States! to Missouri, and sparingly in the mountains of the Southern States. *β.* Saskatchawan &c., *Douglas.* Near Fort Gratiot, Michigan, *Dr. Pitcher!* On limestone cliffs along the Scioto &c. Ohio, *Mr. Sullivant!* May–June.—Stem 6–10 feet long. Leaves 2–3, or on young shoots even 4 inches long, sometimes with a slight and sparse deciduous pubescence beneath, but usually perfectly glabrous; the lower ones often narrowed at the base, but sessile. Corolla 8–9 lines long, including the short spreading limb, yellow tinged with dull purple. Stamens exserted. Berries orange.—In our var. *β.* from Ohio, the pubescence of the lower surface of the leaves is apparently deciduous, and in vigorous shoots they are often 4 or 5 inches long; the lower ones inclined to ovate-lanceolate. We have little doubt that this is the same with the Caprifolium Douglasii of Lindley (although we have never observed the leaves in the slightest degree ciliate), and it has the appearance of a distinct species: but our specimens from Fort Gratiot are exactly L. parviflora, except in the pubescence, and are doubtless the same as Hooker's plant, "which may be seen gradually passing into the usual glabrous appearance." The stamens and style are at first about the length of the corolla.

† † Natives of Oregon and California.

9. *L. Californica*: twining; branches glabrous, or sometimes hairy along one side; leaves ovate-oblong, glabrous, glaucous beneath, not ciliate; the uppermost connate-perfoliate; the others distinct, often slightly petioled;

flowers in rather distant whorls; the peduncle and rachis clothed with glandular and hispid hairs intermixed; tube of the corolla conspicuously gibbous, sparsely hairy, not longer than the deeply bilabiate limb; filaments somewhat hairy towards the base, exserted.—L. ciliosa, *Hook. & Arn. bot. Beechey, p.* 143, *& suppl.! p.* 349; not of *Poir.* (Caprifol. ciliosum, *Pursh.*)

Monterey, California, *Capt. Beechey*; and at St. Francisco? *Douglas!*—Leaves somewhat coriaceous, very pale or glaucous beneath, about 2 inches long; the lower ones obtuse at the base; the slight petioles furnished with stipuliform appendages. Corolla (including the limb) scarcely more than half an inch long, apparently pale yellow; the short tube with a prominent gibbosity on one side; lower lip linear, the upper with 4 very short rounded lobes. Ovaries glandular; the calyx-teeth inconspicuous.—We have not seen the specimens of the plant collected during Capt. Beechey's voyage, in which the younger branches are said to be hairy along one side: in our specimen from Douglas's Californian collection, the branches are glabrous; but the peduncles, &c. densely glandular and somewhat hirsute. It is certainly quite different from the Caprifolium ciliosum of Pursh, and from any other North American species.

10. *L. hispidula* (Dougl. mss.): stem slender, twining or trailing, hirsute or pilose-hispid; leaves rather rigid, ovate or cordate, obtuse, glaucous beneath, and villous-hirsute; the lower ones petioled; the uppermost sometimes connate-perfoliate; heads or whorls on slender peduncles; corolla nearly glabrous; the upper lip shorter than the gibbous tube; filaments slightly hairy below, exserted.—L. microphylla, *Hook. fl. Bor.-Am.* 1. *p.* 283 (without flowers), not of *Willd.* Caprifolium hispidulum, *Lindl.! bot. reg. t.* 1761.

Woods and rocky places, Oregon; on Mount Hood, and at the Grand Rapids of the Oregon, at 'Oak Point,' &c. *Douglas.* 'Oak Point,' on the Oregon near the Sea, *Nuttall!*—A small mostly trailing shrub, pubescent with slender scattered hairs. Leaves 6 to 10 lines, or sometimes an inch in length; the upper surface glabrous, and the one or two upper pairs often connate-perfoliate, in the cultivated plant. Flowers small, rose-color, nearly scentless. Corolla about half an inch long. Ovary glabrous. Calyx-teeth minute.—According to the description and figure in the Botanical Register, the tube of the corolla is twice the length of the limb; but in our specimen (from the Horticultural Society's Garden) the linear lower lip of the corolla is quite as long as the tube. In the wild plant, the leaves are about three-fourths of an inch in length, according to Mr. Nuttall; but the upper ones often smaller.

11. *L. subspicata* (Hook. & Arn.): erect and much branched; the branches, lower surface of the leaves, and corolla pubescent; leaves (small) all distinct, elliptical or oblong, obtuse, coriaceous, shining above, paler beneath, on very short petioles; spikes few-flowered, bracteate; corolla bilabiate; 'one lip 2-, the other 3-cleft.'—*Hook. & Arn. bot. Beechey, suppl. p.* 349.

California, *Douglas.* Bushy hills near St. Barbara, *Nuttall.*—"An erect bush, about 3 feet high; with glandularly pubescent leaves, small pale pink flowers, and a minute calyx." *Nutt. mss.*—Leaves about an inch long, passing into opposite remote pairs of bracts, having in their axils lesser bracteas, which bear the flowers solitary or in pairs. Corolla not half an inch long. The aspect different from any other Lonicera. *Hook. & Arn.*

§ 2. *Leaves never connate: peduncles axillary, 2–4-bracteate and 2– (rarely 3-) flowered at the summit: berries geminate, distinct or often united, 2–3-celled; the limb of the calyx deciduous.*—XYLOSTEON, JUSS.

* *Peduncle 4-bracteate at the summit; the bracts foliaceous and dilated.*

12. *L. involucrata* (Herb. Banks.): stem erect or reclined; branches prominently 4-angled; leaves ovate-oblong or oval, petioled, obtuse or acuminate, hirsute-pubescent beneath; peduncles shorter than the leaves, 2–3-flowered; exterior bracts ovate or subcordate; the interior broadly obovate or obcordate, at first very small, at length many times larger than the distinct ovaries and enclosing the fruit; corolla pubescent, gibbous at the base on the outside.—*Spreng. syst.* 1. *p.* 759; *DC. prodr.* 4. *p.* 336; *Lindl. bot. reg. t.* 1179; *Hook.! fl. Bor.-Am.* 1. *p.* 284. L. Ledebourii, *Eschs. in mem. acad. St. Petersb.* 10. *p.* 284; *DC. l. c.*; *Cham. & Schlecht. in Linnæa*, 3. *p.* 138; *Hook. & Arn.! bot. Beechey, p.* 143, & *suppl. p.* 349. Xylosteon involucratum, *Richards.! appx. Frankl. journ. ed.* 2. *p.* 6.

Saskatchawan! (and woody country from lat. 54° to 64°) and Rocky Mountains, to the North West Coast between lat. 54° & 56°. Also in California, *Eschscholtz, Douglas! Nuttall!*—Stem 2–10 feet long, "often supported by other plants." (*Nutt.*) Leaves 2–3 inches long, on petioles 2–4 lines in length, usually with a short acuminate point. Corolla yellowish, 6–7 lines long, pubescent and glandular, cylindraceous; the lobes short. Stamens included. Stigma mostly somewhat exserted. Bracts somewhat pubescent and glandular; the exterior often nearly half an inch in length: the interior at first very small, but becoming large and conspicuous in fruit, each consisting of two partially united and overlapping bracts.

* * *Peduncle minutely 2-bracteolate at the summit.*

13. *L. ciliata* (Muhl.): stem erect; leaves ovate-oblong, often cordate, pilose-ciliate, the younger ones villous beneath; peduncles shorter than the leaves; bracts shorter than the ovaries; teeth of the calyx very obtuse; corolla obtusely saccate at the base; the lobes short and somewhat equal; style exserted; berries distinct, diverging.—*Muhl. cat. p.* 22; *DC.! prodr.* 4. *p.* 335; *Hook.! fl. Bor.-Am.* 1. *p.* 283. L. Canadensis, *Rœm. & Schult. syst.* 5. *p.* 260. Xylosteum Tartaricum, *Michx.! fl.* 1. *p.* 106. (not L. Tartarica, *Linn.*) X. ciliatum, *Pursh! fl.* 1. *p.* 161 (excl. β. album, which is Symphoricarpus racemosus, fide *Nutt.*); *Torr.! fl.* 1. *p.* 245; *Bigel.! fl. Bost. ed.* 2. *p.* 88.

Rocky woods and hill-sides, throughout Canada (from the Saskatchawan), and the northern portions of the New England States! New York! Pennsylvania and Ohio! May.—Shrub 3–5 feet high, with sparing straggling branches. Leaves membranaceous, light green, 1–2 or more inches long, rather acute: petioles short, beset with a few bristly hairs. Corolla pale greenish-yellow, somewhat funnel-form, about three-fourths of an inch long Filaments glabrous. Berries ovoid, red, about one-fourth of an inch long, 3–5-seeded.

14. *L. cærulea* (Linn.): stem erect; leaves oval or oval-oblong, hirsute on both surfaces, nearly or quite glabrous above when old; peduncles very short, reflexed in fruit; bracts subulate, longer than the ovaries; corolla gibbous at the base; the lobes short, nearly equal; berries (deep blue and glaucous) globose, formed by the union of 2 ovaries.—*Linn. spec.* 1. *p.* 174; *Pall. fl. Ross. t.* 37; *Bot. mag. t.* 1965; *DC. prodr.* 4. *p.* 337; *Hook.! fl. Bor.-Am.* 1. *p.* 283. L. cærulea Canadensis, *Lam. dict.* 1. *p.* 731, ex *DC.* L. villosa, *DC.! l. c.* (excl. syn. *Goldie, Torr.* &c.); *Hook. & Arn.! bot. Beechey, p.* 115. Xylosteum Solonis, *Eaton! man. bot. p.* 518. X. villosum, *Bigel.! fl. Bost. ed.* 2. *p.* 88; *Torr.! fl.* 1. *p.* 245 (excl. syn. *Gold. & Muhl.*); *Richards.! appx. Frankl. journ. ed.* 2. *p.* 6.

β. *villosa:* branches and both surfaces of the leaves densely villous-tomen-

tose; limb of the calyx mostly ciliate.—L. velutina, *DC.! l. c.* Xylosteum villosum, *Michx.! fl.* 1. *p.* 106.

Woods and on rocks, Labrador! and Newfoundland! to the Rocky Mountains in British America, and north to lat. 66°, extending south to the mountains or mountainous districts of Massachusetts! and New York! *β.* Hudson's Bay, *Michaux!* Newfoundland, *Pylaie!* May.—Shrub 1–4 feet high; the younger branches mostly villous. Leaves an inch or less in length. Corolla yellow, about half an inch long, either glabrous or hairy, longer than the peduncles; the lobes longer than the tube, oblong, erect. Stamens scarcely exserted: filaments bearded.—We fully agree with Hooker, in considering our plant identical with the L. cærulea of Europe and Siberia.

15. *L. oblongifolia* (Hook.): stem erect, much branched; leaves oblong or oval, velvety-pubescent when young, at length almost glabrous; peduncles filiform, erect, much longer than the flowers; bracts obsolete; corolla gibbous at the base, deeply bilabiate; berries (purple) globose, formed by the union of 2 ovaries.—*Hook.! fl. Bor.-Am.* 1. *p.* 284, *t.* 100. L. villosa, *DC.! l. c.* partly. Xylosteum oblongifolium, *Goldie, in Edinb. phil. jour.* 6. *p.* 323.

Sphagnous swamps, Canada, *Mr. Goldie, Drummond!* Northern and Western parts of the State of New York! May–June.—Shrub 3–4 feet high. Leaves 1–2 inches long, slightly petioled. Peduncles about an inch long. Corolla half an inch long, greenish-yellow; tinged with purple internally: the lower lip oblong-linear, often spreading; the upper erect, with 4 short lobes. Filaments nearly glabrous, not exceeding the corolla: anthers linear. Style hairy. Berries about the size of a large pea, marked with the vestiges of the two approximated calyces.

4. DIERVILLA. *Tourn. in act. acad. Par.* (1706) *t.* 7. *f.* 1.; *Linn. hort. Cliff. t.* 7; *Lam. ill. t.* 105; *Sieb. & Zucc. fl. Japon. p.* 68. *t.* 29–32.

Weigela, *Thunb.*—Calysphryum, *Bunge.*—Diervilla & Weigela, *Alph. DC.*

Calyx-tube oblong or cylindrical, often attenuated at the summit; the segments of the 5-parted limb linear or subulate. Corolla infundibuliform; the limb 5-cleft, nearly regular or slightly bilabiate. Stamens 5. Ovary 2-celled, crowned with an oblong epigynous gland: stigma peltate-capitate. Fruit capsular, membranaceous or crustaceo-coriaceous, 2-celled, 2-valved, septicidal; the 2-lobed placentæ usually strongly projecting into the cells, each bearing numerous seeds in a double series. Seeds with a scrobiculate testa, naked or cristate.—Shrubs (natives of North America, Japan, and Northern China). Leaves ovate or oblong, mostly petioled, serrate, acute, deciduous. Peduncles axillary or terminal, 1-flowered or cymosely 3–7-flowered; the central flower frequently sessile; all bibracteate at the base.

The Asiatic species have been admirably illustrated by Zuccarini, in the work cited above. These all have a somewhat indurated capsule, and the seeds ('testa membranaceous,' *Zucc.*) furnished with a crest or slight wing; and the flowers are inclined to be rose-color or purple. They form a marked section, at least, which should retain Thunberg's name, *Weigela.* The latter was united to Diervilla by Brown (who first pointed out the mistake into which Thunberg had fallen), and in this he is followed by Zuccarini: while Alphonse De Candolle (*Note sur le genre Weigela*, etc. in the *Bibliothèque Universelle de Genève.* Jan. 1839) not only retains that genus, but divides it into two sections; and this even without being acquainted with the fruit and seeds of the Asiatic plants, which furnish the most obvious dis-

tinctions. We know not whether Mr. Brown was acquainted with these differences when he united Weigela to Diervilla, or whether he would consider them of generic importance. It must be remarked that both the elder and the younger De Candolle have, by some misapprehension, described the capsule of Diervilla as one-celled or half 2-celled; while Jussieu and some other botanists consider it 4-celled, an easy mistake, since the placentæ often reach nearly or quite to the back of each cell.

§ *Flowers yellowish: capsule membranaceous: seeds not furnished with a crest or wing; the testa crustaceous.*—DIERVILLA proper.

1. *D. trifida* (Mœnch): leaves oblong-ovate, acuminate, on short petioles, glabrous, or somewhat hairy on the veins beneath; peduncles 1–3-(mostly 3-)flowered; capsule attenuate at the summit, crowned with the subulate-setaceous teeth of the calyx.—*Mœnch, meth. p.* 492. D. Acadiensis fruticosa &c. *Tourn*; *Duham. arb.* 1. *t.* 87. D. Tournefortii, *Michx.! fl.* 1. *p.* 107; *Torr.! fl.* 1. *p.* 238. D. humilis, *Pers. syn.* 1. *p.* 214. D. Canadensis, *Willd. enum.* 1. *p.* 222; *Bigel.! fl. Bost. ed. p.* 69; *DC.! prodr.* 4. *p.* 330; *Hook.! fl. Bor.-Am.* 1. *p.* 281; *Darlingt.! fl. Cest. p.* 157. D. lutea, *Pursh! fl.* 1. *p.* 162. Lonicera Diervilla, *Linn.! mat. med. p.* 62, & *spec.* 1. *p.* 175.

β. leaves nearly sessile, rather obscurely serrate.

Rocky woods, Canada! and from Newfoundland! and Hudson's Bay to the Rocky Mountains. Northern and Middle States! and along the higher mountains to Carolina. *β.* On the Black Mountains, North Carolina, *Mr. M. A. Curtis!*—May–June. Stem 2–4 feet high, branched. Leaves 2–4 inches long. Peduncles from the axils of the upper leaves, rather longer than the petioles: the central flower sessile, the lateral ones pedicellate. Bracteoles subulate, shorter than the ovary. Corolla greenish-yellow, about three-fourths of an inch long, somewhat irregular; the lobes oblong. Stamens and style exserted. Capsule ovoid-oblong, slightly angled, appearing almost 4-celled by the projection of the placentæ; the summit tapering abruptly into a long and narrow neck, and crowned with the apparently persistent teeth of the calyx.—*Bush-Honeysuckle.*—We should have hardly ventured, perhaps, to restore the prior name of Mœnch (although it is a very good one), had we found any thing like uniformity among botanists in the adoption of some one among the later names.

Subtribe 2. TRIOSTEÆ.—Fruit drupaceous; the endocarp bony. Testa of the seed membranaceous.

5. TRIOSTEUM. *Linn.*; *Gærtn. fr. t.* 26; *Lam. ill. t.* 150.

Calyx-tube ovoid; the segments of the 5-parted limb linear-lanceolate, foliaceous, persistent. Corolla tubular, gibbous at the base, somewhat equally 5-lobed, a little longer than the calyx. Stamens 5, included. Ovary 3-(rarely 4–5-) celled, with a single anatropous ovule suspended from the summit of each cell: style included: stigma capitate, somewhat 3-lobed. Fruit drupaceous, rather dry, roundish-obovoid, obscurely 3–(5-) sided, containing as many ribbed elliptical bony nucules. Testa membranaceous. Embryo minute, oblong, in the axis of fleshy albumen.—Perennial herbaceous or rarely suffrutescent plants (natives of the United States and the mountains of Middle Asia); the lanceolate or oval entire leaves narrowed and somewhat connate at the base. Flowers axillary and sessile or nearly so, solitary or

clustered; or rarely (by the reduction of the leaves) verticillate in a terminal raceme.

1. *T. perfoliatum* (Linn.): stem hirsute with rather soft viscous hairs; leaves ovate or oval, acuminate, abruptly narrowed at the base, velvety-pubescent beneath, somewhat hairy above; flowers (dull brownish-purple) sessile and mostly clustered in the axils.—*Linn. spec.* 1. *p.* 176; *Pursh, fl.* 1. *p.* 162; *Bigel. med. bot.* 1. *p.* 90, *t.* 19; *Bart. veg. mat. med. t.* 4; *Ell. sk.* 269; *DC.! l. c. Torr.! fl.* 1. *p.* 245; *Sweet, Brit. fl. gard.* (*ser.* 2) *t.* 45; *Darlingt. fl. Cest. p.* 159. T. majus, *Michx.! fl.* 1. *p.* 107. Triosteospermum, *Dill. Elth. t.* 293, *f.* 378.

Shady rocky places, in rich soil, throughout the Northern, Middle, and Western States! and along the mountains of the Southern States. May-July.—Root thick and fleshy. Stem 2–4 feet high, stout, simple. Leaves 4–7 inches long, 2–4 wide, sometimes narrowed into a winged petiole, but always connate at the base, often nearly glabrous above. Bracts linear. Corolla 8–10 lines long (about the length of the calyx-segments), viscidly pubescent; the lobes rounded. Filaments hairy. Style slender. Fruit half an inch long, pubescent, orange-color (not purple when mature, as described by Pursh, Barton, & DC.), crowned with the foliaceous spreading limb of the calyx: nucules marked with 3 strong ribs and 4 grooves on the back, and with 2 grooves and a central projection on the face.—The leaves are sometimes more or less sinuate, which is noticed by De Candolle: we have seen Pennsylvanian specimens of this form in the herbarium of the late Mr. Schweinitz. The root is reputed to be emetic and cathartic, and the plant is well-known in the popular materia medica, under the name of *Horse-Gentian, Fever-wort,* or *Wild Coffee.*

2. *T. angustifolium* (Linn.): stem hispid; leaves lanceolate or oblong, acuminate, tapering to the base, pubescent or almost glabrous beneath, hirsute above; the flowers (ochroleucous) mostly solitary in the axils, sessile or somewhat pedunculate.—*Linn.! spec.* 1. *p.* 176 (*pl. Gronov.!*); *Vahl. symb.* 3. *p.* 37; *Pursh, l. c.*; *Ell. l. c.*; *DC.! prodr.* 4. *p.* 330. T. minus, *Michx.! l. c.* Periclymenum herbaceum, &c. *Pluk. alm. p.* 287, *t.* 104, *f.* 2.

Shady places, Virginia! and North Carolina! to Louisiana! Arkansas! and Missouri! May–June.—A smaller species than the preceding, with the lobes of the ochroleucous corolla deeper in proportion, the tube less gibbous at the base, &c. It probably has the same properties as T. perfoliatum, and bears the same popular names. Plukenet received it under the name of *Dr. Tinker's-weed.*

TRIBE II. SAMBUCEÆ. *Kunth.*

Corolla regular, rotate, or rarely somewhat tubular. Stigmas 3–5, nearly sessile. Endocarp of the fruit crustaceous or coriaceous. Testa of the seed membranaceous; the raphe occupying the inner side.

6. SAMBUCUS. *Tourn.; Linn.; Gærtn. fr. t.* 27; *Lam. ill. t.* 211.

Limb of the calyx small, 5-cleft, at length obsolete. Corolla rotate or urceolate, 5-cleft; the lobes obtuse. Stamens 5. Fruit baccate, pulpy, subglobose: nucules 3 (rarely 5), crustaceous, oblong, rugulose, obtusely angled on the back, nearly plane on the face, each containing a suspended seed.—Shrubs or perennial herbs, with a heavy odor. Leaves pinnate or 1–2-pin-

nately divided; the leaflets or divisions serrate or incised, often pseudo-stipellate, or with 2 glands at the base of each pair. Cymes compound, thyrsoid or fastigiate. Flowers white, or sometimes reddish.—*Elder*.

Gærtner, and most subsequent botanists, except Kunth, have described the fruit of this genus as a proper berry; the nucules being taken for seeds.

1. *S. pubens* (Michx.): stem shrubby; leaves pinnately 5–7-foliolate; leaflets ovate-lanceolate, acuminate, the lower surface and the petioles pubescent; thyrsus ovoid or pyramidal, rather loose.—*Michx.! fl.* 1. *p.* 181; *Torr.! fl.* 1. *p.* 321; *DC.! prodr.* 4. *p.* 323; *Bongard! veg. Sitcha, in mem. acad. St. Petersb.* (*ser.* 6) 2. *p.* 144. S. pubescens, *Pers. syn.* 1. *p.* 328; *Pursh, fl.* 1. *p.* 204; *Ell. sk.* 1. *p.* 368. S. racemosa, *Hook.! fl. Bor.-Am.* 1. *p.* 279.

β. leucocarpa: berries white.

γ. arborescens: large; leaflets 7–9, the serratures longer and narrower; anthers large.—S. arborescens, *Nutt.! mss.* S. racemosa *β. Hook.! l. c.*

Rocky woods &c. Canada! from the Saskatchawan, and Northern States! to the mountains of Carolina! West to the Rocky Mountains, Oregon! and Sitcha, (chiefly var. *γ.*) *β.* Cattskill Mountains, *Mr. J. Hogg!* May; the fruit mature in June and July.—Stem 2–10 feet high, sometimes attaining the diameter of 3 or 4 inches at the base; the branches often warty. Leaves very pubescent when young, seldom stipellate. Thyrsus about 3 inches long. Berries scarlet.—Hooker, perhaps with good reason, unites this species with the S. racemosa of Europe, &c. We have occasionally found this plant arborescent, and at least 18 feet high.

2. *S. Canadensis* (Linn.): stem suffrutescent; leaves pinnately 7–11-foliolate; leaflets oblong or oval, acuminate, glabrous, somewhat pubescent on the midrib; the lower ones often 3-parted; cymes spreading, loose, 5-parted.—*Linn.! spec.* 1. *p.* 269; *Michx.! fl.* 1. *p.* 281; *Pursh, fl.* 1. *p.* 203; *Ell. sk.* 1. *p.* 368; *Torr.! fl.* 1. *p.* 321: *DC.! prodr.* 4. *p.* 322; *Hook. fl. Bor.-Am.* 1. *p.* 279; *Darlingt. fl. Cest. p.* 205. S. nigra, *Marsh. arbust. p.* 141. S. humilis, *Raf. ann. nat. p.* 13.

Thickets and along fences, in rich soil, throughout the United States! and Canada! June–July.—Stem 5–10 feet high, stout, filled with pith. Leaflets not unfrequently furnished with foliaceous stipellate appendages. Cymes flat, 5–8 inches in diameter; the flowers pure white. Berries small, dark purple, or nearly black when mature; the juice deep crimson.—Near S. nigra of Europe.—*Common Elder*.

3. *S. glauca* (Nutt.! mss.): "somewhat arborescent, glabrous; leaves pinnate; leaflets 3–5 pairs, lanceolate, acuminate, sharply serrulate, undivided; cyme large and spreading; fruit (black) very glaucous.

"Plains of the Oregon, near the Blue Mountains: common.—Berries resembling in taste those of S. Canadensis, to which this species is allied. *Nuttall.*—We can scarcely distinguish this species from S. Canadensis.

7. VIBURNUM. *Linn.; Gærtn. fr. t.* 27; *DC. prodr.* 4. *p.* 323.

Limb of the calyx 5-toothed. Corolla rotate, sometimes somewhat tubular or campanulate, 5-lobed. Stamens 5. Ovary 1–3-celled; one of the cells containing a single suspended ovule, the others abortive: stigmas 3, sessile. Fruit drupaceous, 1-celled, 1-seeded, with a thin pulp; the endocarp (seed of most authors) crustaceous, mostly compressed. Seed conformed to the cavity of the endocarp; the testa membranaceous. Embryo minute at the ex-

tremity of the fleshy albumen.—Shrubs or small trees, with petioled undivided or lobed leaves. Petioles sometimes furnished with appendages exactly similar to stipules. Flowers white, in terminal cymes; the marginal ones sometimes sterile and radiant.

§ 1. *Flowers all similar and fertile: corolla rotate.*—LENTAGO, DC.

* *Leaves entire, serrate, toothed.*

1. *V. nudum* (Linn.): leaves somewhat coriaceous, oval, oblong, or lanceolate, dotted beneath with brownish scales, glabrous above; the margin crenulate or entire; petiole somewhat margined; cymes pedunculate; fruit ovoid.

α. Claytoni: leaves broadly oval, oblong-obovate, or oblong, obtuse or slightly acuminate, entire or obscurely crenulate; the veins rather prominent beneath.—V. nudum, *Linn.! spec.* 1. *p.* 268 (*pl. Gronov.!*); "*Mill. ic. t.* 274;" *Willd.! spec.* 1. *p.* 1487; *Michx.! fl.* 1. *p.* 178; *Bot. mag. t.* 2281; *Ell. sk.* 1. *p.* 375; *Torr.! fl.* 1. *p.* 319; *Bigel. fl. Bost. ed.* 2. *p.* 116; *DC.! prodr.* 4. *p.* 325; *Darlingt. fl. Cest. p.* 203. V. squamatum, *Wats. dendr. Brit. t.* 24?

β. angustifolium: leaves lanceolate and oblong-lanceolate, often acute, entire or obscurely crenulate-denticulate, the veins slightly prominent beneath.—V. nitidum, *Ait. Kew.* (*ed.* 1) 1. *p.* 371? V. pyracanthifolia, *Schwein.! herb.*

γ. cassinoides: leaves ovate, slightly obovate, or oblong, often abruptly acuminate, the margins crenate-serrate or undulate; the veins not prominent beneath.—V. cassinoides, *Linn.! spec. ed.* 2. *p.* 384 (excl. syn. except of *Duham.*); *Pursh. fl.* 1. *p.* 202; *DC.! prodr.* 4. *p.* 326; not of *Michx.* V. nudum, *Hook.! fl. Bor.-Am.* 1. *p.* 279. V. pyrifolium, *Pursh, l. c.*; *Torr.! fl.* 1. *p.* 318; *Bigel. l. c.*; not of *Poir., Desf. & DC.* – V. squamatum, *Willd.! enum.* 1. *p.* 327; "*Wats. dendr. Brit. t.* 24."

Swamps, *α.* Massachusetts and Southern part of New York! to Florida! and Louisiana. *β.* North Carolina! to Georgia! and New Orleans! *γ.* Northern portion of Pennsylvania and New York! to Canada! Saskatchawan, and Newfoundland! May–June.—Stem 6–12 feet high; the bark ash-gray. Leaves variable in form, size &c. on the same individual, usually 2–4 inches long, turning blackish in drying; the lower surface at first clothed with scaly dots, the upper at length somewhat shining. Cyme as large as in the *Laurustina* (V. Tinus): peduncle 1–2 inches long. Fruit about 3½ lines long, slightly compressed, dark blue, with a glaucous bloom, pointed, sweetish and edible when ripe; the nucleus or stone (seed of some authors) much compressed, slightly convex on one side, and with a shallow groove on the other.—Our var. *β.* is only a narrow-leaved form of V. nudum: the more northern plant (var. *γ.* which is the original V. cassinoides) appears somewhat different; but we can find no permanent characters by which to distinguish it.

2. *V. prunifolium* (Linn.): leaves roundish-oval, broadly ovate or obovate, coriaceo-membranaceous, obtuse or with a slight abrupt point, finely serrate with appressed or uncinate teeth, glabrous; petiole with a slight and even margin; cymes sessile; fruit oblong-ovoid.—*Linn.! spec.* 1. *p.* 267; *Michx.! fl.* 1. *p.* 178; *Pursh, fl.* 1. *p.* 201; "*Duham. arb.* (*ed. nov.*) 2. *t.* 38; *Wats. dendr. Brit. t.* 23;" *Ell. sk.* 1. *p.* 365; *Torr.! fl.* 1. *p.* 318; *Guimp., Otto, & Hayne, holz. t.* 101: *Hook. l. c.*; *Darlingt. l. c.* V. Canadense glabrum, *Vaill.!* V. pyrifolium, *Poir. dict.* 5. *p.* 658; *Desf. cat. hort. Par. ed.* 3. *p.* 404; *DC.! prodr.* 4. *p.* 325. Mespilus prunifolia Virginiana &c. *Pluk. alm. t.* 46, *f.* 2.

β. ferrugineum: lower surface of the petiole and midrib when young covered with reddish-brown wool.

Dry woods and thickets, Canada? and Southern part of New York! and Pennsylvania! to Georgia. β. N. Carolina! and Georgia! to Louisiana! and Arkansas! May.—Shrub or tree 8–20 feet high, with numerous abortive branches or spurs. Leaves 1 to nearly 3 inches long, mostly rounded: the petiole more distinctly margined in the upper than in the lower leaves, about half an inch long; in var. β. clothed with deciduous reddish pubescence or tomentum, which consists of chaff-like laciniate scales rather than proper hairs. Cyme about 3 inches in diameter. Fruit nearly half an inch long (in β. more roundish than in the northern plant), bluish-black when ripe, glaucous, compressed: the nucleus much compressed.—*Black Haw. Sloe.*

3. *V. Lentago* (Linn.): leaves ovate, conspicuously acuminate, finely serrate with sharp slightly uncinate teeth, somewhat membranaceous, glabrous; the lower surface and particularly the midrib and (undulate) margined petioles dotted with minute scales when young; cymes sessile; fruit oval.—*Linn.! spec.* 1. *p.* 268; *Michx.! fl.* 1. *p.* 178; *Ell. sk.* 1. *p.* 365; *Wats. dendr. Brit. t.* 21; *Torr.! fl.* 1. *p.* 318; *Bigel. fl. Bost. ed.* 2. *p.* 116; *DC.! prodr.* 4. *p.* 325; *Hook. l. c.*; *Darlingt. fl. Cest. p.* 325.

Woods and banks of streams, Canada! (from the Saskatchawan) and throughout the Northern States! to Kentucky! and the mountains of Georgia. May.—Tree 15–20 feet high. Leaves usually broadly ovate or oval, about 3 inches long, sometimes slightly cordate; the petiole 6–8 lines long, sometimes covered, as well as the midrib, with rusty scales. Cymes widely spreading. Fruit somewhat compressed, half an inch long, bluish-black when ripe, with a glaucous bloom; the pulp thin and sweetish: nucleus broadly oval, nearly flat on both sides.

4. *V. obovatum* (Walt.): leaves obovate or cuneate-obovate, (small) glabrous, somewhat coriaceous, shining above, mostly obtuse, entire, or often acutely denticulate above the middle; cymes sessile; fruit ovoid-globose, shining.—*Walt. Car. p.* 116; *Poir. dict.* 5. *p.* 658; *Pursh, fl.* 1. *p.* 201; *Ell. sk.* 1. *p.* 366; *Lodd. bot. cab. t.* 1476; *DC.! prodr.* 4. *p.* 326. V. cassinoides, *Mill. dict. no.* 9? (not of *Linn.*); *Willd.! spec.* 1. *p.* 1491 (excl. syn.), & *enum. p.* 327; *Michx.! fl.* 1. *p.* 179. V. lævigatum. *Ait. Kew.* (*ed.* 1.) 1. *p.* 371; *Willd. spec.* 1. *p.* 1492, & *enum. l. c.*; *Pursh, fl.* 1. *p.* 202; *Ell. sk.* 1. *p.* 367; *DC. l. c.*

Shady banks of rivers, &c. Virginia to Georgia! and Florida! April–May.—Shrub 3–8 feet high, with numerous branches, which are dotted when young with minute scales. Leaves 1–1½ inch long, and 3–8 lines wide, on short petioles, often minutely dotted beneath: those of the flowering branches mostly entire: those of the sterile branches frequently acute and sharply denticulate or toothed. Cymes small. Fruit about one-third of an inch long, apparently not glaucous, black, sweetish.—Readily distinguished by its small shining leaves, small and somewhat simple cymes, &c.

5. *V. ellipticum* (Hook.); leaves elliptical, with 3–5 parallel veins, obtuse, coarsely serrate, chiefly towards the summit; the lower surface, particularly the veins, very hirsute; petiole short; cymes pedunculate, dense: ovary either very hairy or glabrous; fruit oval-globose (black). *Hook. fl. Bor.-Am.* 1. *p.* 280.

Shady woods of the Oregon, *Douglas, Nuttall!*—A low shrub. Leaves about 2 inches long, having from 3 to 5 principal nerves springing from the base. Ovary clothed with long hairs; in one specimen quite glabrous. *Hook.*

6. *V. dentatum* (Linn.): leaves roundish-ovate, often slightly cordate, coarsely and sharply toothed, acute or somewhat acuminate, appearing pli-

cate from the strong and nearly simple straight veins, glabrous and shining above, pale beneath, with tufts of villous hairs in the axils of the veins, slightly pilose-ciliate; cymes pedunculate, nearly glabrous; fruit small, globose-ovoid; the nucleus grooved or excavated on one side and obtusely ridged on the other.—*Linn.! spec.* 1. *p.* 268; *Jacq. hort. Vindob.* 1. *t.* 36; *Pursh, fl.* 1. *p.* 202; *Torr.! fl.* 1. *p.* 319; *DC.! prodr.* 4. *p.* 326; *Hook. fl. Bor.-Am.* 1. *p.* 280; *Darlingt. fl. Cest. p.* 203. V. dentatum *var.* lucidum, *Ait. Kew.* (*ed.* 1) 1. *p.* 372. V. dentatum *var.* glabellum, *Michx.* partly.

β.? scabrellum: young branchlets and peduncles scabrous and often hairy; leaves (often large) roundish-cordate or ovate, coarsely and rather obtusely toothed, pubescent beneath; petioles and peduncles shorter.—V. dentatum (*a.* & *β.* chiefly), *Michx.! fl.* 1. *p.* 179; *Ell. sk.* 1. *p.* 365.

Swamps and low grounds; *a.* Canada! and Northern States! to Virginia. *β.* S. Carolina and Georgia! to Florida! and Louisiana! June. *β.* March–May.—Shrub 8–15 feet high (the wood hard), with obtusely angular gray branches; the young vigorous shoots straight and slender. Fruit deep blue, or bluish-black when fully ripe, with very little pulp: nucleus with a deep longitudinal groove on one side, and the edges incurved, so that the transverse section is somewhat reniform; but sometimes there are two shallow grooves, and the edges scarcely incurved.—The northern plant is very common, and uniform in appearance: the leaves are 2–3 inches long and often of nearly the same width, with strong simply-forked veins, and quite glabrous, except the tufts in the axils of the veins, and a few scattered hairs on the young petioles and veins beneath; the peduncle is 2 or 3 inches in length; and the drupes about 3 lines long. But in Pennsylvania this same plant becomes more pubescent; a few scattered hairs often appearing on the upper surface of the leaves, while the young petioles and peduncles are clothed with separate or fasciculate hairs. A still more pubescent plant abounds in the Southern States; the leaves of which (sometimes 4 inches in breadth, but usually scarcely half that size,) are almost villous or velvety when young with somewhat fasciculate hairs, in part only deciduous: the peduncles are about an inch long, and the drupes 4 lines in length. This may very probably be a distinct species, but we are unable to distinguish it satisfactorily as such.—*Arrow-wood.*

7. *V. pubescens* (Pursh): leaves ovate or oval-oblong, acuminate, coarsely toothed, often somewhat cordate, appearing slightly plicate from the straight sparingly branched veins, somewhat hairy above; the lower surface, with the very short petioles, villous-tomentose or velvety; cyme pedunculate, nearly glabrous; fruit (small) oblong; the much compressed nucleus slightly 2-grooved on one side and obtusely ridged on the other.—*Pursh, fl.* 1. *p.* 202 (excl. the habitat. chiefly); *Torr.! fl.* 1. *p.* 320; *DC.! prodr.* 4. *p.* 326; *Hook. fl. Bor.-Am.* 1. *p.* 280. V. dentatum *var.* pubescens, *Ait. Kew.* (*ed.* 1) 1. *p.* 168. V. dentatum *var.* semitomentosum, *Michx.! l. c.* partly. V. villosum, *Raf. in med. repos.* (*hex.* 2) 5. *p.* 361 (1808); & *in Desv. jour. bot.* 1. *p.* 228; not of *Swartz.* V. tomentosum, *Raf. l. c.* (1808) *p.* 354. (without descr.) V. Rafinesquianum, *Rœm. & Schult. syst.* 6. *p.* 630.

Dry rocky banks, Canada (from Lake Winipeg) and northern part of New York! also near West Point! New Jersey, *Beck!* and the mountainous portions of North Carolina, *Schweinitz!* June.—Shrub 2–3 feet high, with straggling branches. Leaves about 2 inches long, nearly glabrous above when old. Peduncle at first shorter than the cyme, but mostly elongated in fruit. Flowers fewer and larger than in V. dentatum. Fruit 3 lines long; the nucleus nearly flat.—Perhaps the plant which Pursh, and even Aiton, had in view, may have been our V. dentatum *β.* scabrellum. The present species extends into the Southern States along the mountains; but certainly does not grow "in the lower parts of Virginia and Carolina." The plant of the *Hortus Kewensis* came from Peter Collinson's garden.

* * *Leaves lobed or incised.*

8. *V. acerifolium* (Linn.): leaves roundish or broadly ovate, mostly subcordate, 3-ribbed from the base, 3-lobed, coarsely and unequally toothed, velvety-pubescent beneath; the lobes divergent and mostly acuminate; petioles (with the young branchlets and ribs of the leaves) pubescent and somewhat hirsute, furnished near the base with two setaceous stipuliform appendages; cymes pedunculate; fruit oval, compressed; stamens much exserted.—*Linn.! spec.* 1. *p.* 268 (*pl. Gronov.!*); *Vent. hort. Cels. t.* 272; *Michx.! fl.* 1. *p.* 180; *Pursh, fl.* 1. *p.* 203; *Ell. sk.* 1. *p.* 364; *Wats. dendr. Brit.* 1. *t.* 118; *Torr.! fl.* 1. *p.* 320; *Bigel. fl. Bost. ed.* 2. *p.* 116; *DC.! prodr.* 4. *p.* 327; *Hook.! fl. Bor.-Am.* 1. *p.* 280 (partly); *Darlingt. fl. Cest. p.* 204.

Woods, particularly in rocky situations, Canada! and nearly throughout the United States! and probably in Oregon. May–June.—Shrub 3–5 feet high, with straight slender branches; the younger branchlets (like the petioles and, in a less degree, the primary veins or ribs of the leaves) usually clothed both with a very short soft pubescence, and with slender rather appressed hirsute hairs. Leaves 2–5 inches in diameter, membranaceous, glabrous or sparsely hairy above, often minutely dotted beneath; the soft close pubescence of the lower surface stellate. Peduncle about 2 inches long; the loose cyme 2–3 inches broad. Corolla often slightly tinged with rose-color. Drupe broadly oval, 3–4 lines long, nearly black when ripe: the nucleus with 2 obtuse ridges on one side, and 2 corresponding shallow grooves on the other.—*Arrow-wood.*

9. *V. pauciflorum* (Pylaie! herb.): branches and petioles glabrous or nearly so; leaves roundish, seldom subcordate, slightly 3-lobed or incised at the summit, mostly 5-nerved from the base, unequally serrate, sparsely pubescent on the veins beneath; petioles destitute of stipuliform appendages; cymes (small and simple) pedunculate, terminating the very short lateral branches; filaments much shorter than the corolla.—V. acerifolium, *Bongard! veg. Sitcha, l. c. p.* 144, partly!

Newfoundland, *Pylaie! &c.* White Mountains of New Hampshire, and on Mansfield Mountain, Vermont, *Mr. Tuckerman! & Mr. W. F. Macrae!* Probably also in Oregon and in Sitcha! June.—Shrub 2–3 feet high. Leaves 1–2 inches in diameter, nearly glabrous, or more or less pubescent on the veins of the lower surface (the hairs not stellate); the lobes often obscure. Cymes seldom an inch in diameter. Anthers on very short filaments, not exserted beyond the tube of the corolla. Fruit unknown.—For specimens of this plant, we are indebted to the promising botanists who first discovered it within the United States (Mr. Macrae of Montreal and Mr. Tuckerman of Boston), who also directed our notice to the characters which clearly distinguish them. We find from our notes upon La Pylaie's collection in Newfoundland, that he had given to the same plant the appropriate name which we have adopted. De Candolle, it will be seen, has referred Pylaie's plant to V. acerifolium. We have another Newfoundland specimen in a small collection made by a British land-surveyor, and given to us by A. B. Lambert, Esq. of London. The V. acerifolium of *Bongard, veg. Sitcha, &c.* appears to belong to, or include this species: but if we mistake not, we have a fragment of the true V. acerifolium from Oregon.—The leaves usually turn blackish in drying.

§ 2. *Cymes radiant; the marginal flowers much larger than the others, and neutral.*—OPULUS, Tourn., DC.

10. *V. Opulus* (Linn.): nearly glabrous; leaves 3-lobed; the lobes acuminate, toothed; petioles glandular; cymes pedunculate; fruit ovate-globose,

red.—*Linn. spec.* 1. *p.* 268 ; *Fl. Dan. t.* 661 ; *Engl. bot. t.* 322 ; *DC. prodr.* 4. *p.* 328. Opulus glandulosus, *Mœnch, meth. p.* 505.

β. Americanum (Ait.) : leaves remotely and rather obtusely toothed.—*Ait. Kew.* (*ed.* 1) 1. *p.* 373. V. trilobum, *Marsh. arbust. p.* 162. V. Opulus *β.* Pimina & *γ.* edule, *Michx.! fl.* 1. *p.* 180. V. opuloides, *Muhl. cat. p.* 32. V. Oxycoccus & V. edule, *Pursh, fl.* 1. *p.* 203 ; *Torr.! fl.* 1. *p.* 320 ; *DC. prodr.* 4. *p.* 328 ; *Hook. fl. Bor.-Am.* 1. *p.* 281 ; *Audubon, birds of Amer. t.* 148.

γ. subintegrifolium (Hook.) : leaves somewhat incised, very pubescent beneath. *Hook. l. c.* under V. Oxycoccus.

Swamps and along streams, from the northern part of Pennsylvania, New-York ! and the New England States ! to the Arctic Circle and the Rocky Mountains. *β.* Oregon, *Dr. Scouler, Douglas.* May–June.—Shrub 3–10 feet high, with glabrous gray spreading branches. Leaves 3–5 inches long, with divaricate lobes ; the base either truncate or somewhat acute ; the lower sprinkled with hairs : petiole often with subulate stipuliform appendages. Cyme 3–4 inches in diameter ; the sterile flowers few or usually numerous, very large. Stamens exserted. Fruit nearly half an inch in length, juicy, of a pleasant acid taste when ripe, often employed as a substitute for cranberries.—We find no constant or essential characters to distinguish our plant from the V. Opulus of Europe ; a garden variety of which, with the flowers all sterile, is the well-known *Snow-ball Bush.* Our plant is called *Cranberry Bush*, or *High Cranberry.*

11. *V. lantanoides* (Michx.) : leaves ovate-orbicular, cordate, abruptly acuminate, finely and unequally or doubly serrate, membranaceous ; the lower surface, and especially the prominent veins and the petioles, tomentose with a pulverulent partly deciduous rusty stellate pubescence ; cymes sessile ; the exterior flowers sterile and very large ; fruit ovoid ; the nucleus with a longitudinal groove on each side.—*Michx.! fl.* 1. *p.* 179 ; *Pursh, fl.* 1. *p.* 202 ; *Torr.! fl.* 1. *p.* 319 ; *Bigel. fl. Bost. ed.* 2. *p.* 117 ; *DC. prodr.* 4. *p.* 326 ; *Hook. fl. Bor.-Am.* 1. *p.* 280. V. Lantana *β.* grandifolium, *Ait. Kew. l. c.* V. Lantana *β.* Canadense, *Pers. syn.* 1. *p.* 327. V. grandifolium, *Smith, in Rees, cycl. no.* 14.

Deep rocky woods, Canada ! the northern part of the New England States ! and New York ! and along the Alleghany Mountains to Virginia May–June.—A low very straggling shrub, with the branches often procumbent. Leaves and inflorescence appearing from the same large buds, every part of the newly developed branch covered with the rusty pulverulent pubescence, which under a lens appears beautifully stellate ; the leaves when old 4–6 inches long and almost the same breadth, nearly glabrous above ; the numerous primary veins strongly prominent beneath, running nearly straight from the midrib to the margin, sending off a few unilateral branches ; the very numerous secondary veins passing between the primary at right angles, forming beautiful transverse reticulations. Cyme large and loose, flat : the radiant sterile flowers an inch in diameter. Fruit nearly black when ripe.—*Hobble-bush.*

12. *V. molle* (Michx.) : leaves somewhat orbicular-cordate, plicate-sulcate, toothed, nearly tomentose with a very soft pubescence underneath ; petioles somewhat glandular ; (cymes radiate ?) fruit oblong-ovate. *Michx.! fl.* 1. *p.* 180 ; *Pursh, fl.* 1. *p.* 203. V. alnifolium, *Marsh. arbust. p.* 162.

Kentucky, around Danville, *Michaux !* "Bark lacerate and deciduous every year." The specimen of Michaux's herbarium is in fruit only, and affords no evidence that the cymes were radiant ; the leaves are crenately toothed, and somewhat resemble one form of V. dentatum *β.* scabrellum. Pursh, who we presume knew nothing of Michaux's plant, refers to it the V. alnifolium of Marshall, which may indeed be the same. We quote Mar-

shall's account entire, and commend this obscure species to the botanists of Kentucky, Tennessee, &c. "This grows naturally in Carolina and other parts of America; rising with a shrubby stalk to the height of 8 or 10 feet, covered with a smooth purplish bark, and divided into several branches. The leaves are heart-shaped, oval, sharp-pointed, deeply sawed on their edges, strongly veined, and placed opposite on slender foot-stalks. The flowers are collected in large cymes or umbels at the ends of the branches; those ranged on the border are male, but the centre is filled with hermaphrodite flowers, which are succeeded by pretty large oval berries, red-colored when ripe." *Marsh. arbust. Amer. p.* 162.

ORDER LXXIII. RUBIACEÆ. *Juss.*

Tube of the calyx adherent to the ovary, or rarely partly or almost completely free; the limb mostly 4–5-cleft or toothed, sometimes obsolete. Corolla inserted upon the summit of the calyx-tube, composed of as many united petals as there are lobes of the calyx, valvate, imbricate, or somewhat contorted in æstivation. Stamens inserted into the tube of the corolla, equal in number and alternate with its lobes (or very rarely fewer): anthers introrse. Ovary 2-(rarely 3–several-) celled, with 1–many ovules in each cell: style single or partly divided: stigmas distinct or concrete. Fruit capsular, drupaceous, baccate, or separable into indehiscent carpels. Seeds anatropous or amphitropous, solitary, few, or numerous in each cell. Embryo straight or slightly curved, in the axis or at the extremity of copious densely fleshy or horny albumen.—Trees, shrubs, or herbs, with opposite, or rarely verticillate, entire leaves. Stipules between the petioles, sometimes simulating the leaves. Flowers regular. Inflorescence various.

SUBORDER I. STELLATÆ. *R. Br.*

Leaves apparently (perhaps really?) verticillate; but the whorls generally supposed to consist of a pair of leaves and 1 to 3 leaf-shaped stipules on each side, which however are only to be distinguished from true leaves by their never bearing buds in their axils. Æstivation of the corolla valvate. Ovary entirely coherent with the tube of the calyx. Fruit consisting of 2 united indehiscent (dry or baccate) 1-seeded carpels.—Herbs, or rarely suffruticose plants, chiefly natives of temperate or cold regions.

1. GALIUM. *Linn.; Lam. ill. t.* 60; *Gærtn. fr. t.* 24; *A. Rich. Rubiac. in mem. soc. hist. nat. Par.* 5. *p.* 133; *Endl. gen. p.* 522.

Calyx-tube ovate-globose or oblong; the limb obsolete. Corolla rotate, 4-(rarely 3-) parted. Stamens as many as the lobes of the corolla, short.

Styles 2, united at the base: stigmas globose. Fruit didymous, dry or sometimes fleshy, separable when ripe into 2 indehiscent 1-seeded carpels. Albumen horny.—Herbaceous or very rarely suffrutescent plants, with tetragonal stems; the root frequently containing a red coloring matter. Flowers (rarely polygamous) small, axillary or terminal, cymulose, or rarely solitary; the cymules often paniculate.—*Cleavers. Bed-straw.*

§ 1. *Root annual.*—Aparine, *DC.*

1. *G. Aparine* (Linn.): stem weak, branching, retrorsely aculeolate-hispid, hairy about the nodes; leaves mostly 8 in a whorl, oblanceolate-linear, apiculate; the margin and keel aculeolate; peduncles elongated, axillary, 1–2-flowered; fruit large, very hispid with hooked bristles.—*Linn. spec.* 1. *p.* 108; *Engl. bot. t.* 816; *Pursh, fl.* 1. *p.* 103; *Bigel. fl. Bost. ed.* 2. *p.* 57; *Torr.! fl.* 1. *p.* 166; *DC.! prodr.* 4. *p.* 608; *Hook. fl. Bor.-Am.* 1. *p.* 290; *Darlingt.! fl. Cest. p.* 100.

Shady thickets and margin of woods, Canada and Northern States! Also in Oregon, *Douglas, Dr. Scouler.* May–June.—Stem 4–8 feet long. Leaves in remote whorls, 1–2 inches in length, and 2–3 lines wide, tapering to the base. Flowers white, very small. Fruit larger than in most other species of the genus.—This plant has perhaps been introduced from Europe into the United States. Hooker describes a very small variety from Oregon.

2. *G. Californicum* (Hook. & Arn.): small, very hairy throughout; stems slender, diffuse, branched from the base; leaves 4 in a whorl, ovate, acute or mucronate; peduncles nearly terminal, 1–3-flowered, much longer than the leaves; lobes of the corolla ovate, very acute; ovary glabrous.—*Hook. & Arn, ! bot. Beechey, suppl. p.* 349.

β. *crebrifolium* (Nutt.! mss.): leaves reflexed; ovary hairy.

γ. *Texanum*: very hirsute throughout.

California, *Menzies, Douglas! Nuttall!* (*a.* & β.) γ. Texas, *Drummond!*—Plant about a span high. Leaves at length much shorter than the internodes, about 4 lines long, 1-nerved, appearing reticulate-veined by transmitted light. "Flowers polygamous, greenish or yellowish-green" (*Nutt.*): the corolla large for the size of the plant. Peduncles and pedicels capillary, the latter usually longer than the flowers.—The var. β. may be only the fertile plant: the fruit is unknown. The Californian plant is probably annual, which is certainly the case with that from Texas: our specimens of the latter are immature, not even in flower; but they doubtless belong to this species.

3. *G. virgatum* (Nutt.! mss.): stems erect, simple or branched from the base, hispid or almost glabrous; leaves 4 in a whorl, oblong-lanceolate, hispidly ciliate, rather obtuse, much shorter than the internodes; peduncles axillary, very short, bibracteolate, 1-flowered; fruit deflexed, hispid with uncinate bristles.

β. *leiocarpum*: fruit glabrous; stem almost glabrous.—G. nutans, *Nutt.! mss.*

Dry prairies of Arkansas, Western Louisiana, and Texas, *Nuttall! Dr. Leavenworth! Dr. Pitcher! Dr. Engelmann! Dr. Hale! Drummond!*—Stem 6–10 inches high, simple, or throwing up undivided ascending branches from near the base. Leaves about one-third of an inch long, thickish, rather obtuse; the midrib usually beset, like the margins, with scattered rigid hairs. Peduncles 1 to 2, or rarely 3 from each whorl, extremely short, furnished with 2 or rarely 3 bracteolate or involucral leaves, which become nearly as

large as those of the whorl, and give the latter the appearance of being 6–8-leaved, or fasciculate. Flowers minute, white, nearly sessile within the bracts: corolla white; the lobes ovate, rather obtuse. Fruit rather large.—This plant has a different habit from any other species of the United States; but it resembles some species of the following section.

§ 2. *Root perennial: fruit fleshy or baccate: peduncles axillary, bearing usually 4 involucrate bracts, one-(rarely 2–3-) flowered.*—Relbuium, *Endl.* (Species of Rubia, *DC.* &c.)

4. *G. hispidulum* (Michx.): stem much branched, diffuse, minutely hairy or hispid, the angles somewhat glabrous; leaves 4 in a whorl, ovate-oblong or oval, mucronulate, minutely hispid, especially on the midrib and margins; peduncles 1–3-flowered; the pedicels (at first very short) elongated in fruit; ovary scabrous-pubescent; fruit baccate.—G. hispidulum & Rubia Brownei (excl. syn. *Browne*), *Michx.! fl.* 1. *p.* 80 & 81. G. hispidulum, *Ell. sk.* 1. *p.* 195. G. hispidum, *Pursh, fl.* 1. *p.* 104. Rubia peregrina, *Walt. Car. p.* 86. R. Walteri, *DC.! prodr.* 4. *p.* 590.

Dry sandy soil, S. Carolina! Georgia! and Florida, particularly near the ocean. May–Oct.—"Root somewhat jointed, saffron-colored." *Ell.* Stems about a foot long. Leaves 5–8 lines long, rather rigid, shining above, appearing somewhat veiny by transmitted light, both surfaces sprinkled with short rigid hairs. Peduncles axillary and terminal: pedicels longer than the fruit. Corolla (white, *Ell.*), with the lobes acuminate. Fruit large, smooth, dark-blue or purple.—The G. hispidulum of Michaux is clearly the same plant as his Rubia Brownei, described from specimens with unripe fruit. The genus Rubia will doubtless be restricted to the pentamerous species, as proposed by A. Richard.

5. *G. uniflorum* (Michx.): glabrous; stems branched at the base, assurgent, slender; leaves usually 4 in a whorl, linear, rather acute, with scabrous mostly revolute margins; peduncles, solitary or opposite, axillary, shorter than the leaves, 1–3-flowered; fruit pedicellate, nodding, glabrous, fleshy.—*Michx.! fl.* 1. *p.* 79; *Ell. sk.* 1. *p.* 95; *DC. prodr.* 4. *p.* 611; *Hook.! compan. to bot. mag.* 1. *p.* 48.

Shady rich soil, S. Carolina! to Florida! and Louisiana! April–July.—Root slender, reddish. Stems 6–12 inches long. Leaves about an inch long and a line wide, shining above, obscurely punctate, 1-nerved. Lobes of the (white) corolla acuminate. Peduncle conspicuously involucrate at the summit, usually bearing a single flower, the pedicel of which is elongated in fruit; sometimes 3-flowered, the lateral pedicels 1–2-bracteolate, rarely forked. Fruit large, fleshy, if not baccate when mature, purple?

§ 3. *Root perennial: fruit dry: peduncles 3-many-flowered.*—Eugalium, *DC.*

* *Flowers white or sometimes greenish: peduncles axillary or terminal, few-flowered, occasionally somewhat clustered at the extremity of the branchlets.*

† Suffrutescent: Californian.

6. *G. suffruticosum* (Nutt.! mss.): "prostrate or climbing, often suffruticose towards the base of the stem, which is acutely quadrangular and minutely aculeolate; leaves 4 in a whorl, very short, ovate-oblong, acute, scabrous on the margin; flowers (polygamous?) pedunculate, dichotomal, and in terminal loose fascicles of few flowers; fruit glabrous.

"St. Diego, California—2f. Nearly allied to G. trichocarpum, notwithstanding the great difference in the fruit." *Nuttall.*

7. *G. trichocarpum* (DC.): much branched; stems erect, suffrutescent, glabrous, the angles obtuse; leaves 4 in a whorl, oblong-linear, 1-nerved, short, rather rigid, the margins and nerve slightly scabrous; branchlets few-flowered; fruit densely clothed with very long straight bristles.—*Nutt.! mss.; DC. prodr.* 4. *p.* 600?

β. leaves apiculate; flowers in small nearly sessile clusters terminating the branches.—G. angustifolium, *Nutt.! mss.*

St. Diego, California *Nuttall!* (*α.* & *β.*) *β.* St. Francisco? *Douglas!*—Stem stout and rigid, a foot or more high. Leaves in closely approximate whorls, about one-third of an inch long, shining, thickish. "Flowers polygamo-diœcious, greenish-white." *Nutt.* Fruit clothed with white straight bristly hairs which are longer than the immature carpels.—This plant, to one form of which Mr. Nuttall has applied the name of G. trichocarpum, is most probably either the same as De Candolle's G. trichocarpum, or his G. eriocarpum, which are both Chilian species.

† † Herbaceous.

8. *G. trifidum* (Linn.): stem flaccid, decumbent or ascending, branching; the angles retrorsely scabrous; leaves in whorls of 4–6 (the lower frequently 5 or 6, the upper 4–5), linear or oblanceolate, obtuse; the margin and midrib minutely (often retrorsely) aculeolate-scabrous; peduncles axillary and terminal, 1–3-flowered; lobes of the corolla (rather obtuse) and stamens often 3; fruit glabrous and even.—*Linn. spec.* 1. *p.* 105; *Fl. Dan. t.* 48; *Wahl. fl. Lapp. p.* 47; *Pursh, fl.* 1. *p.* 103; *Torr.! fl.* 1. *p.* 165; *Bigel. fl. Bost. ed.* 2. *p.* 56; *DC.! prodr.* 4. *p.* 597; *Cham. & Schlecht. in Linnæa,* 4. *p.* 221; *Darlingt. fl. Cest. p.* 99. G. Claytoni, *Michx.! fl.* 1. *p.* 78; *Richards.! appx. Frankl. journ. ed.* 2. *p.* 4; *Hook.! fl. Bor.-Am.* 1. *p.* 288. Aparine floribus albis, &c. *Clayt.!* (*Gronov. fl. Virg. ed.* 2. *p.* 18.)

β. tinctorium: stem (usually stouter) scarcely or not at all scabrous; lobes of the corolla and stamens mostly 4.—G. tinctorium, *Linn. l. c.; Pursh, l. c.; Torr.! l. c.; DC.! l. c.; Darlingt. fl. Cest. p.* 100. G. trifidum, *Ell. sk.* 1. *p.* 194?

γ. latifolium (Torr.): stem diffuse, not scabrous: leaves elliptical or oblong; the margins and midrib manifestly ciliolate-scabrous.—*Torr.! fl.* 1. *p.* 165. G. obtusum, *Bigel. fl. Bost. ed.* 2. *p.* 55.

Swamps and moist low grounds, Canada! (from lat. 68°) to Virginia! S. Carolina and Western Louisiana! and from Newfoundland! to Oregon! Unalaschka, and Sitcha; also in California (*Nuttall*). June–July.—Stem 5 inches to 2 feet in length, erect when young, branched, at length diffuse or reclined. Leaves frequently only quaternate, 5–10 lines long, often less than a line wide, varying up to 3 or 4 lines wide, in var. *γ.* rather membranaceous, narrowed at the base. Flowers very small, white. Pedicels of the fruit slender.—A widely diffused and very variable species; the various forms of which are so blended, that we think no botanist, with a full series of specimens, will succeed in distinguishing two or more species. There is a dwarf state, growing in northern sphagnous swamps, which appears scarcely to differ from the G. palustre except in the scabrous angles of the stem: this form is also a native of the north of Europe. We have another state from Oregon (which Hooker has probably referred to G. tinctorium), which much resembles G. asprellum in its numerous flowers and very scabrous stem and margins of the leaves. The var. *γ.* is a more robust form, with larger fruit, and grows in drier soil: the margins of the leaves are almost ciliate, while the angles of the stem are smooth. No character can be derived from the direction of the very minute bristles which fringe the margin of the leaves: they are sometimes directed upwards on one margin and downwards on the other. The var. *β.* as well as *γ.* have usually larger fruit. The leaves are apt to turn blackish in drying.

9. *G. concinnum:* stems diffuse, decumbent, with retrorsely and minutely scabrous angles; leaves in whorls of 6 throughout, linear, mucronulate, 1-nerved, veinless, glabrous, with upwardly scabrous margins; peduncles filiform, often twice or thrice trichotomous, slightly paniculate at the extremity of the branches; pedicels short; lobes of the corolla acute or acuminate; ovary glabrous.

Dry open woods and hill-sides, Michigan, abundant near Ann Arbor! Blue Lick, Kentucky, *Dr. Short!* May–June.—Stems diffusely branched, a span to a foot high, slender, very leafy, rather rigid, as well as the smooth and shining leaves: the latter about half an inch long, or a little longer in the Kentucky plant, about a line wide. Flowers very small, but numerous, white; the peduncles and short pedicels almost capillary.—We have not seen the fruit. The leaves do not turn black in drying, and their margins and the angles of the stem are often very slightly scabrous.

10. *G. asprellum* (Michx.): stem diffuse, much branched, the angles very scabrous with minute and rigid retrorse prickles; leaves 6 (those of the branchlets often 4 or 5) in a whorl, elliptical or lanceolate, mucronate or acuminate, glabrous, except the retrorsely aculeolate-hispid margins and midrib; peduncles short, very numerous, crowded or paniculate on the flowering branchlets, di-trichotomous; pedicels filiform, divaricate; fruit glabrous or minutely hispid.—*Michx.! fl.* 1. *p.* 78; *Pursh, fl.* 1. *p.* 103; *Torr.! fl.* 1. *p.* 166; *Bigel. fl. Bost. ed.* 2. *p.* 54; *DC.! prodr.* 4. *p.* 598; *Darlingt. fl. Cest. p.* 100. G. Pennsylvanicum, *Muhl. cat. p.* 15; *Willd. mss. in Schult. mant.* 3. *p.* 183. G. micranthum, *Pursh, fl.* 1. *p.* 103? G. spinulosum, *Raf. prec. decouv.* (1814) *p.* 40?

Swampy thickets, Canada! and Northern States! common: probably also in the mountains of the Southern States. July.—Stems flaccid, usually supported on bushes, and attaining the height of 2 to 5 feet, adherent to objects which it touches by the minute sharp hooked prickles of its stem and leaves: the latter in approximate whorls, about half an inch long, tapering at the base; the lower obtuse and abruptly mucronate; the upper acuminate into a scarious subulate point. Flowers pure white, very small but extremely numerous, covering the branchlets: the peduncles and pedicels short but filiform. Lobes of the corolla acute. Fruit perhaps usually glabrous when ripe, but not unfrequently more or less hispid when young; in which state it is probably the G. micranthum of Pursh.—There is a specimen in Elliott's herbarium, mixed with his G. cuspidatum; but no locality is given. The leaves usually turn blackish in drying.

11. *G. triflorum* (Michx.): stem flaccid, reclining or procumbent, retrorsely somewhat aculeolate-scabrous or slightly hispid on the angles, shining; leaves 6 in a whorl, narrowly elliptical or elliptical-lanceolate, acuminate-cuspidate, 1-nerved, veiny, glabrous, the margins and sometimes the midrib minutely ciliolate-hispid or scabrous; peduncles axillary and terminal, mostly 3-flowered at the extremity; the flowers all pedicellate; fruit hispid with uncinate hairs.—*Michx.! fl.* 1. *p.* 80; *Willd. hort. Berol. t.* 66; *Pursh, fl.* 1. *p.* 104; *Ell. sk.* 1. *p.* 197; *Torr.! fl.* 1. *p.* 167; *Bigel. fl. Bost. ed.* 2. *p.* 56; *DC.! prodr.* 4. *p.* 601; *Hook.! fl. Bor.-Am.* 1. *p.* 290; *Darlingt.! fl. Cest. p.* 101. G. cuspidatum, *Muhl.! cat.* (*ex herb. & herb. Willd.*); *Ell.! sk.* 1. *p.* 197; *DC. l. c.* G. brachiatum, *Pursh, fl.* 1. *p.* 103. G. suaveolens, *Wahl. fl. Lapp. p.* 48. G. Pennsylvanicum, *Bart. compend. fl. Philad.* 1. *p.* 83, not of *Muhl.*

Moist woodlands, nearly throughout the United States (from Maine! to Alabama! and Louisiana!) and Canada! to Oregon! California (*Nuttall*), Unalaschka! and Sitcha. Also a native of Lapland, Sweden, and Russia as far south as Moscow! June–July.—Stem 1–4 feet long, sometimes quite smooth and glabrous even on the angles; the branches short and divergent.

Leaves membranaceous (sometimes in whorls of 5), tapering at the base, varying in size from 2 inches to three-fourths of an inch in length; those of the branches more conspicuously cuspidate. Peduncles rarely twice trichotomous. Flowers small, greenish, or greenish-white in open places: the lobes of the corolla acute or acuminate. Fruit densely hispid with white hairs.—This plant has a wide range, and (although well-marked) is subject to considerable diversities, which however we cannot distinguish as varieties. The smaller-leaved forms (G. cuspidatum, *Ell.* &c.) abound in the Southern States. It exhales a vanilla-like odor in drying.

* * *Flowers dull purple or brownish: peduncles axillary and terminal, usually* 2-3 *times di-trichotomous.*

12. *G. pilosum* (Ait.): stem ascending, hirsute or hairy; leaves 4 in a whorl, oval, mucronulate, indistinctly 3-nerved at the base, punctate with pellucid dots, hairy and ciliate; peduncles usually twice or thrice di-trichotomous at the extremity of the branches, the flowers all distinctly pedicelled; fruit densely hispid with uncinate bristles.—*Ait. Kew.* (*ed.* 1) 1. *p.* 145; *Pursh, fl.* 1. *p.* 104; *Ell. sk.* 1. *p.* 196; *Torr.! fl.* 1. *p.* 167; *Darlingt.! fl. Cest. p.* 101. G. puncticulosum *β.* pilosum, *DC.! prodr.* 4. *p.* 601. G. purpureum, *Walt. Car. p.* 87 ?

β. puncticulosum: stem and leaves, except their ciliate margins, almost glabrous.—G. puncticulosum, *Michx.! fl.* 1. *p.* 80; *DC.! l. c.* G. Bermudense, *Linn. spec.* 1. *p.* 105, as to syn. *Gronov.*, but not of *Pluk. alm. t.* 248. G. Bermudianum, *Pursh. fl.* 1. *p.* 104; *Ell. l. c?* G. punctatum, *Pers. syn.* 1. *p.* 128.

Dry woods, and in sterile shady soil, throughout the United States, from New York! to Texas! *β.* Virginia! to Louisiana! June–July.—Stems 1–2 feet high, often several from the same root, mostly simple, except the short spreading flowering branches; the pubescence variable in degree. Leaves about three-fourths of an inch long. Flowers paniculate-cymulose; the ultimate divisions of the peduncle 3-flowered. Lobes of the brownish-purple corolla acute or acuminate. Fruit very strongly hispid with white bristles.—The name of G. Bermudense should be retained for the 'Rubia tetraphylla glabra, latiore folio, Bermudensis,' etc. of Plukenet.

13. *G. circæzans* (Michx.): stem erect or ascending, nearly smooth, or sometimes hairy; leaves 4 in a whorl, oval or ovate-oblong, mostly obtuse, 3-nerved, somewhat pubescent, the margin and nerves ciliate; peduncles terminal or lateral, usually once dichotomous, divaricate in fruit, bearing several remote deflexed flowers on extremely short lateral pedicels; fruit densely hispid with uncinate bristles.—*Michx.! fl.* 1. *p.* 80; *Ell. sk.* 1. *p.* 197; *Torr.! fl.* 1. *p.* 168 (excl. syn. *Gronov.*); *Bigel.! fl. Bost. ed.* 2. *p.* 55; *DC.! prodr.* 4. *p.* 601; *Darlingt. fl. Cest. p.* 102. G. brachiatum, *Muhl. cat. p.* 16, not of *Pursh.* G. boreale, *Walt. Car. p.* 257. G. circæoides, *Roem. & Schult. syst.* 3. *p.* 256.

β. lanceolatum (Torr.): leaves lanceolate, or often ovate-lanceolate, rather acute.—*Torr.! cat. pl. New York, p.* 23; *DC.! l. c.* G. lanceolatum, *Torr.! fl.* 1. *p.* 168; *Hook. fl. Bor.-Am.* 1. *p.* 280; *Darlingt. fl. Cest. p.* 102. G. Torreyi, *Bigel.! fl. Bost. ed.* 2. *p.* 56.

γ. montanum: dwarf; leaves obovate, nearly glabrous.—G. Littellii, *Oakes! mss.*

Rich woodlands, Canada! to Florida, Louisiana! Arkansas! and Missouri! *γ.* Mountains of New Hampshire, Vermont, and New York, *Mr. Oakes! Mr. W. F. Macrae! Mr. Tuckerman.*—Stems 10–18 inches high, often many from the same root, or branched from the base. Leaves 1–1½, or in *β.* sometimes more than 2 inches long, variable as to pubescence; the

lower surface marked with scattered indistinct vesicular dots. The inflorescence assumes a scorpioid form: the peduncles usually fork at the base of the pedicel of the earliest flower, but seldom if ever afterwards: beyond this the divisions of the peduncle are prolonged indefinitely, bearing a solitary almost or quite sessile (central or alar) flower at each node. Corolla brownish-purple (rarely cream-colored!); the lobes acuminate-cuspidate. Fruit clothed with dense white bristles.—The leaves of our var. *β.* are said by Dr. Darlington, not to have the sweet taste which characterizes G. circæzans: that plant is usually perhaps sufficiently distinct in appearance, but the frequent intermediate states seem to forbid their separation. We suppose our var. *γ.* to be a state of this species growing upon high mountains; but our specimens are insufficient. The stems are 4–6 inches long, and the leaves large in proportion.—*Wild Liquorice.*

14. *G. latifolium* (Michx.): stem erect, smooth; leaves 4 in a whorl, lanceolate, acute, 3-nerved, punctate with oblong pellucid dots, glabrous; the margins and midrib minutely hispid-ciliolate; peduncles axillary and terminating the short branches, twice or thrice dichotomous, and with the filiform pedicels divaricate or spreading; fruit (pretty large) glabrous.—*Michx.! fl.* 1. *p.* 79; *DC.! prodr.* 4. *p.* 599.

β. leaves rather rigid, less acute; pedicels and ovaries sparsely and minutely scabrous.—G. latifolium, *Hook. compan. to bot. mag.* 1. *p.* 48.

On the Alleghany Mountains of North and South Carolina, *Michaux! Fraser* (in *herb. DC.*) and of Georgia, *Mr. Buckley!* *β.* Missouri (or Arkansas?) *Dr. Engelmann!* June–July.—Stem a foot or more high. Leaves 1–2 inches long, tapering from near the base to the apex, rather acute at each end; the whorls somewhat distant. "Flowers violet-purple." *Michx.*—We have seen the specimens in the herbaria of Michaux and De Candolle, but have only recently received the plant from Mr. Buckley, who states that it is very common on the Alleghany Mountains: our specimen is in fruit. The variety from Dr. Engelmann is in the same state, and only differs (besides the slight characters indicated above), in having the whorls more approximated. It is a well-marked species.

* * * *Flowers white; the peduncles disposed in a terminal panicle.*

15. *G. boreale* (Linn.): stem erect, straight, smoothish; leaves 4 in a whorl, linear-lanceolate, strongly 3-nerved, rather obtuse; panicle elongated, somewhat pyramidal; fruit hispid with short scarcely uncinate hairs, or sometimes glabrous.—*Linn. spec.* 1. *p.* 108; *Pursh, fl.* 1. *p.* 104; *Torr.! fl.* 1. *p.* 169; *Hook.! fl. Bor.-Am.* 1. *p.* 289; *Darlingt. fl. Cest. p.* 103. G. Bermudianum, *Muhl. cat. p.* 16. (ex herb., fide *Darlingt.*) G. strictum, *Torr.! cat. pl. New York. p.* 23. G. septentrionale, *Rœm. & Schult. syst.* 3. *p.* 253; *Bigel.! fl. Bost. ed.* 2. *p.* 54; *DC.! prodr.* 4. *p.* 601.

Woods and rocky banks of streams, Northern States! and Canada! to Arctic America and Oregon! July.—Stem 1–2 feet high, somewhat branching, often pubescent at the nodes. Leaves 10–18 lines long, often rather broadly lanceolate, and slightly ciliate when young in the American plant. Lobes of the corolla acute.—There is an European variety with glabrous fruit, and another with the ovary very slightly and sparsely hispid: both these states occur not unfrequently in this country.

16. *G. rubioides* (Linn.): stem erect, straight, smoothish; leaves 4 in a whorl, elliptical-lanceolate, strongly 3-nerved, scabrous on the margin; peduncles numerous, trichotomous, disposed in a large terminal panicle; fruit glabrous.—*Linn. spec.* 1. *p.* 105; *Cham. & Schlecht. in Linnæa,* 3. *p.* 220; *DC. prodr.* 4. *p.* 599; *Hook. & Arn. bot. Beechey, p.* 115; *Hook. fl. Bor.-Am.* 1. *p.* 289.

Dry elevated soils, under pine trees, in the valley of the Oregon, *Douglas.*

Kotzebue's Sound, *Capt. Beechey*.—This is a robust plant, with the habit of G. boreale, but with larger and broader leaves. Hooker states that he has received specimens of it from the United States, under the name of G. Bermudianum; but his plant is perhaps G. latifolium. On the authority of Steven, De Candolle mentions a variety with hispid fruit.

* * * * *Flowers yellow, in dense panicles terminating the branches: fruit smooth.*

17. *G. verum* (Linn.): stem erect, slender; leaves 8 in a whorl, narrowly linear, sulcate, scabrous, with somewhat revolute margins; flowers crowded.—*Linn. spec.* 1. *p.* 107; *Engl. bot. t.* 660; *Fl. Dan. t.* 1146; *Bigel. ! fl. Bost. ed.* 2. *p.* 55; *DC. prodr.* 4. *p.* 603.

Dry pastures, Roxbury, Massachusetts, *Bigelow !* North Bridgewater, Massachusetts, *Mr. Tuckerman !* Doubtless introduced from Europe. June–July.

‡ *Doubtful Species.*

18. *G. parviflorum* (Raf.): stems diffuse, angled, glabrous; leaves in whorls of 5 or 6, linear-lanceolate, very acute, glabrous; flowers paniculate (white, minute). very numerous.—*Raf. in med. repos.* (*hex.* 2) 5. *p.* 360, & *in Desv. jour. bot.* 1. *p.* 227.

Near Newcastle, Delaware, *Rafinesque.*

SUBORDER II. CINCHONEÆ. (Order Cinchonaceæ, *Lindl.*)

Leaves opposite, or very rarely verticillate. Stipules one (2 united) or two on each side between the petioles (interpetiolar), often united with each other or with the petioles, or with both, so as to form a sheath. Æstivation of the corolla valvate, imbricated, or contorted. Ovary coherent with the tube of the calyx, or very rarely with the upper portion free.—Chiefly tropical or subtropical trees or shrubs, rarely herbs.

TRIBE I. SPERMACOCEÆ. *Cham. & Schlecht.*

Fruit dry, or scarcely fleshy, composed of 2 (rarely 3 or 4) 1-seeded carpels; which are sometimes concrete, sometimes separating and indehiscent, or variously dehiscent, but never loculicidal. Albumen fleshy or somewhat horny. Æstivation of the corolla valvate.—Herbs or shrubs. Stipules membranaceous at the base, usually with several bristles at the apex.

Subtribe 1. EUSPERMACOCEÆ, *DC.*—Flowers distinct. Fruit dry, separating when mature into 2 (rarely 3 or 4) carpels, or sometimes inseparable.

2. SPERMACOCE. *Linn.* (partly); *Gærtn. fr. t.* 25; *Cham. & Schlecht. in Linnæa*, 3. *p.* 355; *DC. prodr.* 4. *p.* 552.

Calyx-tube ovate or turbinate; the limb 2–4-parted, sometimes with accessory teeth. Corolla hypocrateriform or infundibuliform, 4-lobed. Stamens 4. Stigma 2-cleft or undivided. Fruit dry, crowned with the (sometimes obliterated) teeth of the calyx, 2-celled; the 2 one-seeded carpels separating from the apex downwards; the one closed by the dissepiment, the other open. Seeds oval-oblong, peltate, marked with a shallow furrow on

the face.—Herbaceous or rarely suffrutescent plants (chiefly tropical), with linear, oblong, or roundish leaves. Stipules cohering with both petioles, sheathing, fringed with several bristles. Flowers small, axillary, sessile, crowded or in whorls, usually pale blue or white.

Spermacoce, Borreria, and Diodia, differ only in the dehiscence of the fruit: in the first, one carpel opens while the other remains closed; in the second, both are dehiscent; in the third, both are indehiscent.

1. *S. glabra* (Michx.): herbaceous, perennial, procumbent, glabrous; leaves lanceolate; whorls many-flowered; calyx 4-toothed; corolla campanulate-funnel-form, a little longer than the calyx, very woolly in the throat; anthers included, nearly sessile at the base of the tube; style very short; stigma 2-lobed; fruit turbinate.—*Michx.! fl.* 1. *p.* 82; *Pursh, fl.* 1. *p.* 105.

Banks of rivers, Western and South Western States! Middle Florida, *Dr. Chapman!* Texas, *Drummond!* July–Aug.—Stem branching, 1–2 feet long; the branches somewhat quadrangular. Leaves 1–3 inches long, acute, attenuate at the base. Stipules with 5–6 subulate bristles, which are several times longer than the sheath. Whorls 10–20-flowered. Flowers scarcely more than 1½ line long. Teeth of the calyx lanceolate. Corolla white; the lobes semi-oblong. Style almost wanting: stigma with 2 diverging lobes. Capsule chartaceous; the cells tardily separating. Seeds attached by the middle of the face to the placenta. Embryo in the axis of cartilaginous albumen: cotyledons oblong: radicle pointing downwards.—The plant becomes blackish in drying.

2. *S. Chapmanii:* perennial? stem herbaceous, sparingly branched, slightly angled with 4 elevated lines, glabrous: leaves oblong-lanceolate, acute, attenuated at the base into a petiole, somewhat scabrous above; stipules with 5–6 bristles, which are rather longer than the sheath; flowers in dense axillary clusters; corolla funnel-form, 3 times as long as the calyx: stamens exserted; style long and slender; stigma indistinctly 2-lobed; capsule oblong-pyriform, crowned with 4 calyx-teeth.

Middle Florida, on the banks of the Aspalaga River, *Dr. Chapman!* and in Louisiana!—Stem about 2 feet high. Leaves an inch and a half long, rather strongly marked beneath with the simple oblique veins. Clusters of flowers dense, often half an inch in diameter. Calyx slightly hairy: the teeth lanceolate. Corolla 3 lines long, white? Filaments slender, inserted in the throat of the corolla: anthers oblong. Style glabrous, scarcely exserted. Capsule coriaceo-crustaceous, dehiscent when mature, and leaving the thin dissepiment adhering to one of the cells.—Nearly allied to S. tenuior; but that species has a short obovate fruit, and very short included stamens and style. We have specimens from Louisiana (in flower, without fruit), but have no memorandum of the source from which they were derived; in these the lobes of the corolla are sprinkled, both internally and externally, with short, flattish, apparently deciduous hairs.

3. *S. tenuior* (Linn.): stem annual, branching: the branches obtusely angled, glabrous or somewhat scabrous; leaves lanceolate, with short petioles, scabrous on the margin and upper surface; stipules with 5–6 bristles, which are rather longer than the sheath; whorls few, many-flowered: corolla somewhat campanulate, the tube scarcely twice the length of the calyx; stamens much shorter than the corolla: style the length of the stamens; stigma 2-lobed; capsule obovate, crowned with 4 calyx-teeth.—*Linn. spec.* 1. *p.* 102; *Lam. ill. t.* 62, *f.* 1; *A. Rich. mem. Rub. l. c. t.* 4, *no.* 2; *DC. prodr.* 4. *p.* 552. S. verticillis tenuioribus, *Dill. Elth. t.* 277, *f.* 359.

Key West, Florida, *Mr. Blodgett!*—Stem 8–12 inches long, in our speci-

mens glabrous. Leaves about an inch long. Whorls few-(6–10-) flowered. Flowers smaller than in the preceding species. Anthers roundish-oblong.—This is chiefly a West Indian species, and we doubt whether it has been found hitherto within the limits of our Flora.

‡ *Doubtful Species.*

4. *S. involucrata* (Pursh): stem alternately branched, very hispid; leaves ovate-lanceolate, acuminate, hirsute on both surfaces; stipules with many bristles; heads terminal, involucrate: stamens exserted. *Pursh, fl.* 1. *p.* 105.

Carolina, *Fraser.*—About a foot high. Leaves broad and somewhat oblique. Flowers white, with a very long tube. *Pursh.*—The specimen in Mr. Lambert's herbarium, which is said to have been collected by Fraser (but we suspect there is some mistake as to the locality), is marked, perhaps by Mr. Don, "S. strigosa, *Bot. mag.*"; a species which has been referred to the genus Crusea.

3. BORRERIA. *Meyer, fl. Essequeb. p.* 79; *DC. prodr.* 4. *p.* 540.

Bigelovia, *Spreng. syst.*; not *Spreng. entd.*, nor of *Smith*, nor of *Raf.* nor of *DC.*

Calyx-tube ovate; the limb persistent, 2–4-toothed. Corolla infundibuliform or hypocrateriform, 4-lobed. Stamens 4. Stigma 2-cleft or undivided. Fruit dry, crowned with the teeth of the calyx, 2-celled; the 2 one-seeded carpels separating from the apex downwards, and each dehiscing equally by a longitudinal chink along the inner surface. Seeds obovate-oblong, marked on the face with a longitudinal furrow.—Herbaceous or suffrutescent (tropical) plants. Leaves sometimes apparently verticillate from the fascicles in the axils. Stipules cohering with both petioles, fringed with several bristles. Flowers small, in axillary or terminal usually capitate whorls, blue or white.

1. *B. micrantha:* annual; stem prominently 4-angled, glabrous; the nodes distant; leaves linear-lanceolate, acute at each end, scabrous above, nearly glabrous underneath; bristles of the stipules 8–10, much longer than the scabrous sheaths; whorls many-flowered, all of them axillary; calyx-tube hispid; corolla hypocrateriform, shorter than the calyx-teeth; capsule ovate, membranaceous, crowned with the 4 spreading lanceolate-subulate calyx-teeth.

Tampa Bay, Florida, *Dr. Leavenworth!*—Stem 2 feet or more in length (erect?); the internodes about 2 inches long. Leaves 1–2 inches in length, and 2–3 lines wide, almost hispidly scabrous above. Whorls 40–50-flowered. Corolla white, scarcely a line long. Stamens very short. Style included, notched at the apex. Capsule at first splitting within the calyx-teeth contrary to the dissepiment, and afterwards septicidally nearly to the base. Seed oblong, nearly terete, black, strongly pitted, with a narrow groove on the face.—In the mode of dehiscence, this plant resembles Hedyotis, one species of which (H. monosperma, *Wight & Arn.*) has but a single seed in each cell.

4. DIODIA. *Linn.*; *Gærtn. fr. t.* 25; *DC. prodr.* 4. *p.* 561.

Calyx-tube ovate or obovate, often 8-nerved; the limb 2–4-parted. Corolla infundibuliform or tubular, 4-lobed. Stamens 4, inserted into the throat of the corolla. Stigma or style 2-cleft or undivided. Fruit dry or slightly

fleshy, crowned with the teeth of the calyx, 2- (rarely 3-) celled; the 2 (or 3) one-seeded carpels separating from the apex downwards, both indehiscent. Seeds oval, peltate, flattish, marked with a shallow furrow on the face.—Herbaceous or rarely suffrutescent plants (American, but chiefly tropical), with the habit of Spermacoce. Leaves often fascicled in the axils, so as to appear verticillate. Stipules usually fringed with bristles. Flowers small, white, axillary, solitary or several together.

* *Corolla somewhat hypocrateriform, with a long and very slender tube: style deeply 2-cleft; fruit crowned with 2 (or 4 alternately smaller) calyx-teeth.*

1. *D. Virginiana* (Linn.): perennial, herbaceous; stem procumbent; leaves varying from lanceolate-linear to oblong-lanceolate, sessile; bristles of the stipules longer than the sheaths; flowers solitary, opposite; tube of the corolla 3 or 4 times the length of the calyx-teeth, tubular, the limb abruptly expanded; stamens exserted; lobes of the deeply 2-cleft style filiform; fruit ovoid or oblong, coriaceous, crowned with 2 (rarely 4 alternately smaller) lanceolate calyx-teeth.

α. Linnæi: nearly glabrous; leaves lanceolate: fruit oblong, somewhat glabrous.—D. Virginiana, *Linn. spec.* 1. *p.* 104: *Lam. ill. t.* 63. D. Virginica, *Willd. spec.* 1. *p.* 58 (excl. syn. *Walt.*); *Pursh, fl.* 1. *p.* 105; *Ell. sk.* 1. *p.* 190; *DC. prodr.* 4. *p.* 562. Spermacoce Virginiana, *A. Rich. mem. l. c. t.* 4, *f.* 3.

β. latifolia. somewhat pubescent; leaves ovate-lanceolate: fruit ovate, hairy.—D. Virginica, *Michx.! fl.* 1. *p.* 81. D. tetragona, *Walt. Car. p.* 87; *Ell. sk.* 1. *p.* 190; *DC. l. c.*

γ. hirsuta: whole plant very hairy; leaves linear-lanceolate, very acute; fruit oblong.—D. hirsuta, *Pursh, fl.* 1. *p.* 106: *Ell sk.* 1. *p.* 191: *DC. l. c.*

Damp soil, particularly along rivers. *α.* & *β.* Virginia! to East Florida! Alabama and Louisiana! *γ.* South Carolina, *Elliott.* Georgia, *Pursh,* Middle Florida, *Dr. Chapman!* May–Oct.—Stem 1–2 feet long, somewhat quadrangular. Leaves 1–2 inches long: in *β.* those of the branches much shorter and broader in proportion than the lower cauline ones: in *γ.* nearly all of equal length. Flowers nearly half an inch long. Corolla white; the segments lanceolate-oblong, more or less hairy inside. Anthers linear. Capsule 2–3 lines long in *α.* and *β.*, 4–5 lines in *γ.*, marked with several strong longitudinal ridges. Seed oblong, plano-convex. Embryo nearly as long as the albumen: colyledons oblong: radicle inferior, slender.—We find so many intermediate forms between D. Virginica, tetragona, and hirsuta of authors, that we can scarcely distinguish them even as varieties.

* * *Corolla infundibuliform, with a wide tube: style undivided: stigma capitate or 2-lobed: fruit crowned with* 4 (*rarely* 5) *calyx-teeth.*

2. *D. teres* (Walt.): annual, ascending or procumbent; stems pubescent or hairy; leaves linear or linear-lanceolate; bristles of the stipules much longer than the fruit; flowers solitary or 2–3 in each axil; corolla much longer than the minutely serrulate-ciliate calyx-teeth; the stamens shorter than its lobes; stigma large, 2-lobed; fruit somewhat hairy, ovoid-turbinate and somewhat quadrangular, separating into 2 crustaceous carpels.—*Walt. Car. p.* 87; *DC.! prodr.* 4. *p.* 562; *Darlingt. fl. Cest. p.* 104. Spermacoce diodina, *Michx.! fl.* 1. *p.* 82; *Pursh, fl.* 1. *p.* 85; *Ell. sk.* 1. *p.* 189; *Torr.! fl.* 1. *p.* 170.

Sandy fields, New Jersey! to Florida! and Louisiana! and west to Illinois! and the sources of the Canadian River, *Dr. James!* Aug.–Sept.—Stem nearly terete, 4–16 inches high, much branched, clothed with a short

pubescence, and sprinkled with spreading hirsute hairs. Leaves about an inch long, pale, the margins and midrib ciliolate-scabrous. Corolla 3–4 lines long, white or pale red, sprinkled with minute hairs under a lens. Anthers linear-oblong. Capsule (usually but one in each axil) about 2 lines long, much longer than the calyx-teeth.

3. *D. tricocca:* perennial, much branched, depressed; stems somewhat hairy: leaves linear, with revolute margins; bristles of the stipules scarcely as long as the fruit; flowers glomerate in the upper axils; corolla scarcely exceeding the strongly hispid teeth of the calyx (often 3-lobed); the stamens about the length of the lobes: stigma small, capitate; fruit obovate-globose, at first hispid, scarcely longer than the (4, rarely 5!) conspicuous calyx-teeth, separating into 3 chartaceous carpels.

Texas, *Drummond!*—Plant resembling a small state of D. teres, 3–4 inches high, apparently perennial. Leaves smooth above; the margins and midrib beneath somewhat hairy or hispid, at least when young. Flowers and fruit much smaller than in the preceding: the latter scarcely half the size, and apparently always tricoccous, very hispid when young, as well as the lanceolate teeth of the calyx, with stout bristles; but the mature fruit is often nearly or quite glabrous; the carpels roundish-obovate, flattened.—Our specimens do not exhibit the corolla in good condition: but all the flowers which we have examined present a 3-lobed corolla, 3 stamens, and a tricarpellary ovary, while the teeth of the calyx are 4, or very rarely 5, in number. Probably these characters are not constant, but the species is very different from any with which we are acquainted.

Subtribe 2. PUTORIEÆ, *DC.*—Flowers distinct. Fruit somewhat fleshy or drupaceous, seldom bipartible.

5. ERNODEA. *Swartz, prodr. p.* 29, *& fl. Ind. Occ. p.* 223, *t.* 4; *Gærtn. fr. t.* 196, *f.* 6; *A. Rich. mem. l. c. t.* 15, *f.* 2; *DC. prodr.* 4. *p.* 576.

Calyx-tube ovate; the lobes of the 4–6 parted limb oblong-linear, acute, pubescent. Corolla hypocrateriform, with a somewhat quadrangular tube; the lobes 4–6, lanceolate, revolute, valvate in æstivation. Filaments inserted into the upper part of the tube: anthers linear, exserted. Style filiform, longer than the stamens: stigma emarginate. Fruit drupaceous, obovate or roundish, 2-celled, crowned with the long erect segments of the calyx, bipartible when mature; the nuclei 1-seeded, cartilaginous, indehiscent. Seeds peltate, flat and furrowed on the face. Embryo straight: cotyledons oval.—A suffrutescent and decumbent glabrous (West Indian) plant; with sessile somewhat rigid lanceolate leaves. Stipules sheathing, many-parted. Flowers axillary, solitary, sessile, yellowish. Fruit yellow.

E. littoralis (Swartz, l. c.)—Knoxia, *P. Browne, Jam. p.* 140. *no.* 1. Thymelea, *Sloane, hist. Jam. t.* 169.

Key West, *Mr. Blodgett!* Southern Florida, *Dr. Hassler!*—Stem 6–10 inches long, branching from the base, stout and rigid; the branches quadrangular. Leaves mostly crowded towards the extremity of short branches, about an inch long, somewhat coriaceous or fleshy, very acute and mucronate, 3-nerved. Flowers small. Fruit with a thin and rather dry pulp, separable when ripe into 2 plano-convex portions, crowned with the long lanceolate foliaceous calyx-teeth.

Subtribe 3. CEPHALANTHEÆ, *DC.*—Flowers and fruit sessile and densely aggregated on a globose receptacle. Fruit dry, 2–4-partible.

6. CEPHALANTHUS. *Linn.*; *Lam. ill. t.* 59; *Gærtn. fr. t.* 86.

Calyx-tube obpyramidal; the limb 4-toothed. Corolla tubular, slender; the lobes of the 4-cleft limb erect, imbricate in æstivation. Stamens 4, scarcely exserted. Style filiform, much exserted: stigma capitate. Fruit inversely pyramidal, coriaceous, 2–4-celled, separating from the base to the summit into 2–4 closed one-seeded portions. Seeds pendulous, conformed to the cell, crowned with a kind of corky arillus. Embryo straight, in the axis of somewhat cartilaginous albumen: cotyledons oblong, foliaceous: radicle slender.—Shrubs (American); with oval or lanceolate (opposite or ternate) leaves. Stipules short, distinct or somewhat united. Flowers densely aggregated in a globose head (the receptacle hairy): the peduncles terminal and from the upper axils. Corolla white.—*Button-Bush. Pond-Dogwood.*

1. *C. occidentalis* (Linn.): mostly glabrous; leaves opposite and ternate, ovate or oblong-oval, acuminate, distinctly petioled, usually glabrous; peduncles longer than the heads, usually ternate at the extremity of the branches.—*Michx.! fl.* 1. *p.* 87; "*Duham. arb. t.* 54, *Schkuhr. handb. t.* 21, & *t.* 5. & 6. *fr.*"; *Pursh. fl.* 1. *p.* 114; *Ell. sk.* 1. *p.* 186; *Torr.! fl.* 1. *p.* 164; *Bart. fl. Amer. Sept.* 3. *t.* 91; *Darlingt. fl. Cest. p.* 98; *DC. prodr.* 4. *p.* 538.

β. younger branches and lower surface of the leaves pubescent.

Margin of swamps and wet thickets, Canada! and Northern States! to Georgia! Arkansas! and Texas! (the northern plant usually glabrous: the southern more or less pubescent.) July–Aug.—Shrub 3–10 feet high, branched, with light spongy wood, and smooth bark. Leaves 3–5 inches long, more frequently opposite than ternate, feather-veined. Heads an inch in diameter, on peduncles about 2 inches long. Calyx-tube produced above the ovary; the teeth obtuse, persistent. Corolla nearly half an inch long; the limb somewhat funnel-form; the lobes obtuse.

TRIBE II. COFFEEÆ. *DC.*

Fruit drupaceous, containing 2 one-seeded bony or crustaceous nucules; which are flattish or grooved on the inner side, and often marked with a furrow on the outer. Albumen horny or somewhat cartilaginous. Æstivation of the corolla usually valvate.—Trees or shrubs. Stipules 2 between the petioles on each side, either distinct or combined. Flowers distinct, or in capitate involucrate fascicles.

7. CHIOCOCCA. *P. Browne, Jam. p.* 174; *Linn.*; *Lam. ill. t.* 480; *Gærtn. fr. t.* 26; *A. Rich, mem. l. c. p.* 106; *DC. prodr.* 4. *p.* 482.

Calyx-tube ovate; the limb acutely 5-toothed. Corolla campanulate-infundibuliform, 5-lobed; the lobes spreading. Stamens 5: filaments inserted into the base of the corolla, and scarcely cohering with it, somewhat monadelphous, pubescent: anthers linear, included. Style filiform, some-

what clavate at the summit: stigma entire, or of 2 agglutinated lobes. Fruit fleshy, globose-compressed and somewhat didymous, crowned with the calyx-teeth, including 2 oblong coriaceous nucules. Seeds suspended. Embryo straight, in the axis of somewhat cartilaginous albumen: radicle long and slender: cotyledons small.—Shrubs (tropical American), often with sarmentose branches. Leaves petioled, glabrous. Stipules connate. Flowers white or often turning yellowish, in axillary opposite racemes. (Root emetic, &c.)

1. *C. racemosa* (Jacq.): leaves oval, acute at each end; corolla many times longer than the teeth of the calyx; filaments puberulent.—*Jacq. stirp. Amer. p.* 68; *Michx.! fl.* 1. *p.* 103; *Andr. bot. rep. t.* 284; *Hook.! exot. fl. t.* 93; *DC. prodr.* 4. *p.* 482. (*ε. Floridana.*) Jasminum flore myrtino, &c., *Sloane, Jam. t.* 188. *f.* 3. Periclymenum racemosum, &c., *Dill. Elth. t.* 228, *f.* 295. Lonicera alba, *Linn. spec.* 1. *p.* 175.

Sea coast of Florida, *Michaux!* Key West, *Mr. Blodgett!* (Also West Indian & Mexican.)—Leaves 2–3 inches long, and an inch or more broad, abruptly tapering at the base into a narrow petiole, somewhat shining above. Racemes in the axils of the uppermost leaves, and exceeding them in length, usually simple; the flowers somewhat secund, "at first white and inodorous, but at length yellowish and odorous". Fruit about the size of a pea, white. The branches are sometimes sarmentose; the leaves somewhat variable in form, and often acuminate; and the racemes either simple or paniculate.—*Snowberry.*

8. PSYCHOTRIA. *Linn.; Gærtn. fr. t.* 25; *DC. prodr.* 4. *p.* 504; *W. & Arn. prodr. Ind. Or.* 1. *p.* 432.

Calyx-tube ovate; the limb short, 5-lobed, 5-toothed, or somewhat entire. Corolla infundibuliform, usually short, 5- (or rarely 4-) cleft, regular, with the throat glabrous or bearded; the limb spreading or recurved; the segments incurved at the point: æstivation valvular. Stamens 5, or rarely 4: anthers exserted or included within the throat of the corolla. Stigma 2-cleft. Fruit drupaceous, containing 2 nucules, crowned with the limb of the calyx, usually marked with 10 ribs by drying; sometimes 4-angled and with four furrows, sometimes even; nucules chartaceously coriaceous, ribbed, angled, or even, 1-seeded. Seed erect, with a cartilaginous solid (not ruminated) albumen.—Trees or shrubs, rarely herbaceous plants. Leaves opposite, petioled. Peduncles usually terminal. Flowers panicled or corymbose. *Arn.*

1. *P. lanceolata* (Nutt.): leaves lanceolate, acuminate at each end; the lower surface as well as the branchlets ferruginous-pubescent; stipules amplexicaul, roundish, deciduous, sphacelate; corymb terminal, trichotomous at the base. *DC.—Nutt. in Sill. jour.* 5. *p.* 290 (1822); *DC. prodr.* 4. *p.* 513.

East Florida, *Mr. Ware.*—"Leaves 2–3 inches long. Berries ovate, red."—This is unknown to us. De Candolle remarks that he has seen a specimen collected by Michaux. We have insufficient specimens, apparently belonging to another species of Psychotria, collected in Florida by Dr. Leavenworth.

TRIBE III. GUETTARDEÆ. *Kunth.*

Fruit drupaceous, 2–8-celled, or containing 2–8 one-seeded nucules. Seeds somewhat terete, elongated, usually erect. Albumen mostly fleshy. Æstivation of the corolla usually contorted or valvate.—Small trees, shrubs, or very rarely herbs. Stipules between the petioles.

Subtribe 1. MORINDEÆ, *DC.*—Flowers and fruit aggregated in a dense head and more or less coherent with each other. Æstivation of the corolla valvate.—Tropical shrubs or small trees.

9. MORINDA. *Vaill.; Linn.; Lam. ill. t.* 153; *Gærtn. fr. t.* 29.

Calyx-tube obovate, cohering with the adjoining flowers; the limb short, scarcely toothed. Corolla infundibuliform; the tube somewhat terete; the limb spreading, 5- (rarely 4-) lobed. Stamens 5 (rarely 4): filaments short: anthers usually included. Style filiform: stigma 2-cleft; the lobes filiform. Fruit baccate, containing 2–4 nucules, all usually concreted into a compound subglobose fruit, which is areolate with the traces of the calyx. Embryo terete, in a fleshy albumen.—Shrubs or trees. Leaves opposite, rarely 3 or 4 in a whorl. Stipules within the petioles, usually obtuse. Peduncles solitary or several together, axillary, opposite the leaves (from the suppression of a leaf), or terminal. Flowers sessile upon a globose receptacle. (Bark of the root styptic and used for dyeing.)

1. *M. Royoc* (Linn.): glabrous, procumbent at the base; leaves broadly oblanceolate, acute, gradually narrowed at the base into a short petiole; stipules broad and very short, bimucronate; peduncles short, axillary or opposite a leaf; stamens somewhat exserted.—*Linn. spec.* 1. *p.* 176; *Jacq. hort. Vindob. t.* 16; *DC. prodr.* 4. *p.* 448. Royoc humifusum, *Plumier, gen. p.* 11, *t.* 26. Periclymenum Americanum, &c., *Pluk. alm. t.* 212, *f.* 4.

Key West, *Mr. Blodgett!* Common in the West Indies, &c.—Leaves 2–3 inches long, glabrous on both surfaces, except a pubescence in the axils of the larger veins underneath. Peduncles 4–6 lines long, usually opposite a leaf. Heads about half an inch in diameter. Flowers crimson.

Subtribe 2. MITCHELLEÆ.—Flowers solitary, or geminate with their ovaries united. Æstivation of the corolla valvate. Albumen somewhat cartilaginous or corneous.—Creeping evergreen herbs, natives of the northern and southern extratropical regions, and on mountains within the tropics.

10. MITCHELLA. *Linn.; Lam. ill. t.* 63; *Gærtn. fr. t.* 192.

Chamædaphne, *Mitch.*; not of *Buxb.*

Flowers in pairs, with their ovaries united. Limb of the calyx conspicuous, 4-toothed. Corolla infundibuliform, with a slender tube, 4-lobed; the lobes spreading, densely hirsute or bearded within (as well as the throat) with white hairs. Stamens 4, somewhat included: filaments inserted into the

throat of the corolla: anthers oblong. Style filiform: stigmas 4, linear, somewhat exserted. Fruit baccate, oblate-globose, usually composed of the united ovaries of both flowers (one of them sometimes abortive, or wanting ?); each of which contains 4 small corneous 1-seeded nucules. Embryo minute, at the extremity of somewhat cartilaginous albumen: cotyledons short; the radicle thick. Glabrous creeping evergreen herbs (indigenous to North America, and perhaps to the mountains of Peru ?) with opposite ovate or roundish petioled leaves. Stipules triangular-subulate, minute. Flowers terminal, white or pale rose-color, odorous. Fruit bright red, edible, persistent.

We have drawn the character exclusively from M. repens; since it is doubtful whether M. ovata, *DC.* (which we have not seen,) belongs to this genus, rather than to Nertera. Does not the Nertera depressa, *Banks* (or rather *Solander*), as left by De Candolle, include two or more species ?

1. *M. repens* (Linn.): leaves roundish-ovate, often slightly cordate; peduncle 2-flowered.—*Linn.! spec.* 1. *p.* 111; *Michx.! fl.* 1. *p.* 86; *Pursh, fl.* 1. *p.* 101; *Ell. sk.* 1. *p.* 198; *Torr.! fl.* 1. *p.* 174; *Bigel. fl. Bost. ed.* 2. *p.* 52; *Bart. fl. Amer. Sept. t.* 95, *f.* 1; *DC.! prodr.* 4. *p.* 452; *Hook.! fl. Bor.-Am.* 1. *p.* 287; *Darlingt. fl. Cest. p.* 105. Syringa baccifera, &c., *Pluk. amalth. t.* 444, *f.* 2; *Catesb. Car.* 1. *t.* 20. Lonicera foliis subovatis &c. *Gronov.! fl. Virg. ed.* 1. *p.* 22.

Deep moist woods, about the roots of trees, Canada and throughout the United States! to Florida! and Louisiana! (Also in Mexico, ex *DC.*) June. (November to April in the Southern States. *Ell.*)—Stems slender, branching, 6–12 inches long. Leaves on slender petioles, half an inch or more in diameter, dark green and shining, usually with a pale longitudinal line, of a firm texture, turning blackish in drying. Corolla about half an inch long; the limb sometimes 3-cleft (and then triandrous), occasionally 5–8-cleft, but never (we believe) with more than 4 stamens. Berries about a third of an inch in diameter, broader than long, crowned with the persistent teeth of two calyces, bright red, edible but insipid, persistent through the winter and until the plant flowers again.—*Partridge-Berry.*

Subtribe 3. EUGUETTARDEÆ, *DC.* (excl. gen.)—Flowers distinct. Æstivation of the corolla usually contorted. Albumen fleshy.—Tropical trees or shrubs.

11. GUETTARDA. *Linn.; Vent. choix. t.* 1; *Gærtn. fr.* 1. *t.* 36; *A. Rich. mem. l. c. p.* 121.

Calyx-tube ovate or globose; the limb tubular, persistent or deciduous, truncate or irregularly toothed. Corolla hypocrateriform; the tube cylindrical; lobes 4–9, oval-oblong. Anthers 4–9, nearly sessile in the throat of the corolla, linear. Stigma capitate, rarely 2-lobed. Fruit drupaceous, subglobose or ovate, usually crowned with the persistent limb of the calyx: endocarp bony, obtusely angled, 4–9-celled; the cells 1-seeded. Seeds somewhat terete.—Small trees or shrubs (mostly tropical American); with ovate or lanceolate, or rarely cordate leaves. Stipules lanceolate, deciduous. Peduncles axillary, once or twice dichotomous; the flowers sessile in the forks and unilateral on the branches of the peduncle.

1. *G. elliptica?* (Swartz): leaves ovate and elliptical, rather obtuse, mucronulate, hairy on both surfaces; petioles short; peduncles usually shorter than the leaves; cymes 2-cleft; flowers tetramerous; tube of the corolla silky-hirsute, three times as long as the calyx; limb of the calyx at length deciduous.—*Swartz, prodr. p. 59? DC. prodr.* 4. *p.* 457!

Key West, Florida, *Mr. Blodgett!*—A shrub; the younger branches pubescent. Leaves 1–2 inches long, rather acute at the base, the lower surface more hairy than the upper: petiole 2–3 lines long. Peduncles sometimes rather longer than the leaves, twice or thrice dichotomous. Flowers about one-third of an inch long. Calyx truncate, often notched on one side of the orifice, with 2 subulate bracteoles at the base. Corolla dull crimson internally. Style filiform, included: stigma entire. Immature fruit ovate.—We have not seen authentic specimens of G. elliptica, the species which agrees most nearly with ours; but it seems to differ in the leaves being smoothish above, and in the 2-lobed stigma.

12. ERITHALIS. *P. Browne, Jam. t.* 17, *f.* 3; *Linn.*; *Lam. ill. t.* 159; *Gærtn. fr. t.* 26; *A. Rich. mem. l. c. p.* 133; *DC. prodr.* 4. *p.* 465.

Calyx-tube ovate; the limb short, 5-toothed. Corolla somewhat rotate, 5-parted; the segments linear. Stamens 5: filaments subulate, inserted into the base of the corolla: anthers linear-oblong. Style stout, as long as the filaments: stigma bilamellate, the lobes agglutinated. Ovary 5–10-celled, with a single pendulous ovule in each cell. Drupe globose, somewhat fleshy, sulcate, with 5–10 bony nucules.—Glabrous (chiefly West Indian) shrubs. Leaves petioled, somewhat coriaceous. Stipules persistent, short and broad. Flowers in paniculate cymes from the axils of the uppermost leaves.

1. *E. fruticosa* (Linn.): leaves obovate; panicles pedunculate; fruit 8–10-sulcate, crowned with the truncate limb of the calyx.—*DC. prodr. l. c.* E. odorifera, *Jacq. stirp. Amer. p.* 72. *t.* 173, *f.* 23.

Southern Florida, *Dr. Leitner!*—Leaves about 2 inches long, obtuse, the lateral veins indistinct, abruptly tapering at the base into a short petiole. Stipules with a small mucronate point. Cymes 10–15-flowered: flowers odorous, crimson?

TRIBE IV. HAMELIEÆ. *A. Rich., DC.*

Fruit baccate, 3–many-celled; the cells many-seeded. Albumen fleshy.—Trees or shrubs. Stipules between the (rarely verticillate) petioles.

13. HAMELIA. *Jacq. stirp. Amer. p.* 71. *t.* 50, & *ic. rar. t.* 335; *Lam. ill. t.* 155; *Gærtn. fr. t.* 191 & 196.

Calyx-tube oval; the lobes 5, short, erect, acute, persistent. Corolla tubular, somewhat 5-angled, slightly 5-lobed at the summit; the lobes equal, scarcely spreading. Stamens 5, inserted into the middle of the corolla, included: anthers oblong-linear. Stigma obtuse, somewhat 5-angled. Berry oval, 5-furrowed, 5-celled; the cells membranaceous, many-seeded. Seeds minute, compressed.—Tropical American shrubs. Leaves often ternately or quaternately verticillate, petioled. Stipules one on each side, lanceolate-subulate. Flowers red or orange, showy, in di-trichotomous or scorpioid cymes.

1. *H. patens* (Jacq.): leaves ternate, oval-oblong, acuminate at each end, villous-pubescent underneath; cymes colored, di-trichotomous, in a terminal pedunculate umbel; corolla cylindrical. *DC.*—*Jacq. stirp. Amer. l. c.*; *Smith, exot. bot. t.* 24; *DC. prodr.* 4. *p.* 441. H. coccinea, *Swartz, prodr. p.* 46. Duhamelia patens, *Pers. syn.* 1. *p.* 203.

Key West, Florida, *Mr. Bennett!*—A shrub 8–10 feet high, with a trunk 3–4 inches in diameter; the younger branches minutely pubescent. Leaves 2–4 inches long, and an inch or more in diameter, somewhat glabrous above. Cymes usually forked, with the flowers sessile and unilateral on the divisions; the common peduncle trifid. Flowers bright red, very handsome. Berry about one-fourth of an inch long. Seeds oval, scrobiculate, only one (in our specimen) ripening in each cell.

TRIBE V. EUCINCHONEÆ. (Cinchonaceæ, *DC.*)

Fruit capsular, 2-celled; the cells many-seeded. Seeds winged. Albumen fleshy.—Trees or shrubs. Stipules between the petioles.

14. EXOSTEMMA. *DC. diss.* 1806; *A. Rich. mem. l. c. p.* 280.

Exostema, *Pers.* (§ of Cinchona), *L. C. Richard.*

Calyx-tube obovate; the limb 5-toothed. Corolla with a long terete tube; the segments of the 5-parted limb linear, revolute, valvate in æstivation. Stamens 5, inserted into the corolla near the base, much exserted: anthers narrowly linear. Style filiform, clavate at the summit: stigma entire or somewhat 2-lobed. Capsule coriaceous, opening at the summit by septicidal dehiscence. Seeds flat, with a circular winged margin, retrorsely imbricated.—Trees or shrubs of tropical America, (the bark febrifugal or somewhat emetic; but destitute of Quinia and Cinchonia, according to St. Hilaire), usually glabrous. Stipules one on each side. Peduncles axillary or terminal.

1. *E. Caribæum* (Rœm. & Schult.): leaves ovate-lanceolate, acuminate, glabrous; pedicels axillary, 1-flowered, about the length of the petiole; teeth of the calyx very short.—*Rœm. & Schult. syst.* 5. *p.* 18; *DC. prodr.* 4. *p.* 359. Cinchona Caribæa, *Jacq. stirp. Amer. t.* 179, *f.* 65, *& obs.* 2. *t.* 17; *Gærtn. fr. t.* 33; *Lamb. Cinch. t.* 4; *Andr. Bot. rep. t.* 481. C. Jamaicensis, *Wright, in phil. trans.* 67. *p.* 504, *t.* 10.

Key West, *Mr. Blodgett!*—A glabrous shrub. Leaves 1½–2 inches long, somewhat coriaceous. Stipules broad and very short, with a subulate point. Flowers crimson, odorous, showy. Pedicels half an inch long. Calyx-teeth rather acute. Corolla nearly 2 inches long; the tube about the length of the linear segments. Anthers half an inch in length and very slender. Style much exserted: stigma entire.—The bark of this plant is used in the West Indies as a substitute for Cinchona bark.

15. PINCKNEYA. *Michx. fl.* 1. *p.* 103, *t.* 13; *A. Rich. mem. l. c. p.* 277.

Calyx-tube oblong-turbinate; four of the segments of the deciduous 5-parted limb linear-lanceolate, the fifth usually dilated into a large colored leaf. Tube of the corolla cylindrical; the lobes of the 5-parted limb linear-oblong, recurved-spreading, somewhat imbricate in æstivation. Stamens 5, inserted into the corolla near the base, exserted: anthers oblong. Style fili-

form: stigma obtusely 2-lobed. Capsule subglobose, coriaceo-chartaceous, 2-valved, loculicidal. Seeds numerous, horizontal, in a double series, flat, with a reticulated membranaceous wing. Embryo large, straight: cotyledons foliaceous, concave.—A large shrub or small tree; the young branches &c., hirsute-tomentose. Stipules one on each side, linear-subulate, caducous. Flowers large, in small cymes, which are terminal or in the axils of the upper leaves. Corolla purplish inside, hirsute-canescent externally.

P. pubens (Michx.! l. c.)—*Michx. f. sylv.* 1. *p.* 260, *t.* 49; *Pursh, fl.* 1. *p.* 158; *Ell. sk.* 1. *p.* 269; *Nutt.! gen.* 1. *p.* 137; *DC. prodr.* 4. *p.* 366; *Bart. fl. Amer. Sept. t.* 7; *Audubon, birds of Amer. t.* 165. P. pubescens, *Gærtn. f. fruct.* 3. *p.* 80, *t.* 194. Pinknea pubescens, *Pers. syn.* 1. *p.* 197. Cinchona Caroliniana, *Poir. dict.* 6. *p.* 40.

Swamps, S. Carolina! to Middle Florida! May–June.—Stems or trunks often clustered. Leaves oval, acute or acuminate at both ends, on short petioles, nearly glabrous above, pubescent or somewhat tomentose beneath, 4–8 inches long, and 3 or 4 broad. Limb of the calyx somewhat colored; one (or sometimes two) of the segments dilated into an oval membranaceous (rose-colored) petioled leaf, two or three inches in length. Corolla an inch and a half long; the segments shorter than the tube. Capsule about half an inch in diameter; the dehiscence loculicidal and at length partly septicidal also.—This genus is doubtless sufficiently distinct from Mussænda, to which Jussieu joined it, and with which it accords in habit. The bark has the taste and medicinal properties of Cinchona, and probably contains the same or a new alkaline principle.

TRIBE VI. HEDYOTIDEÆ. *Cham. & Schlecht.*

Fruit capsular, 2-celled, usually loculicidal (rarely somewhat membranaceous and indehiscent); the cells several-many-seeded. Seeds wingless. Albumen fleshy. Æstivation of the corolla mostly imbricated or contorted.—Herbs or shrubs. Stipules between the petioles, either one or two on each side, or frequently united with the petioles into a membranaceous sheath, which is often fringed with bristles, as in Spermacoceæ.

16. HEDYOTIS. *Linn.; Lam. ill. t.* 62; *A. Rich. mem. l. c.; Hook. fl. Bor.-Am.* 1. *p.* 286; *W. & Arn. prodr. Ind. Or.* 1. *p.* 405; *Endl. gen. p.* 548, *& iconogr. t.* 89.

Hedyotis, Houstonia, & Oldenlandia, *Linn.*—Anotis &c., *DC.*

Calyx-tube ovate or globose; the limb 4- (rarely 5-?) toothed or cleft, persistent. Corolla infundibuliform, hypocrateriform, or rotate, 4- (rarely 5-?) lobed; the lobes imbricate in æstivation. Stamens as many as the lobes of the corolla, inserted either in the throat or towards the base of the tube. Stigma usually 2-cleft or 2-lobed. Capsule globose, ovoid, or obcordate, mostly coriaceous, the summit often free from and exserted beyond the calyx, 2-celled, opening across the summit by loculicidal dehiscence, and at length often slightly septicidal. Seeds few or numerous, on placentæ (either ascending or horizontal) which project into each cell, with a reticulate-punctate or scrobiculate testa.—Herbs, or suffruticose plants. Stipules connate

with the petiole on both sides, entire, toothed, or sometimes fringed with bristles. Flowers axillary or terminal, solitary, cymulose, or glomerate. **Plant often turning blackish in drying.**

§ 1. *Corolla hypocrateriform; the tube much longer than the teeth or segments of the calyx (which are distant in fruit); the limb glabrous: stamens and style diœcio-dimorphous*, i. e., *the stamens in one plant inserted in or near the throat of the corolla, and often somewhat exserted, and then the style included; in the other, the stamens inserted into the tube of the corolla near the base, and the style exserted: filaments short: anthers linear or oblong: capsule somewhat didymous or 2-lobed, the very broad summit free from the calyx, loculicidal: seeds several* (8–20 *in each cell*), *scrobiculate or reticulated, oval or roundish, with a deep hollow on the face: small annual or sometimes perennial herbs: stipules entire, minute: peduncles axillary or terminal, one-flowered.*—HOUSTONIA, Linn. hort. Cliff. (Species of Anotis, *DC., Arn.? Endl.* Poiretia, *Gmel.* Panetos, *Raf.?*)

The name Houstonia must be retained for whatever section shall include H. cærulea, on which that genus was founded in the *Hortus Cliffortianus*. This, if considerably extended, would probably include a large portion of De Candolle's species of Anotis, but in a more restricted sense perhaps very few. Hedyotis (Anotis) gentianoides, *Endl. iconogr. t.* 89, certainly belongs to this section.

1. *H. minima:* annual, glabrous, at length dichotomous and depressed; leaves linear-spatulate, with a long attenuate base; peduncles not exceeding the leaves; capsule obcordate, free only at the summit; seeds oval, nearly smooth, with a broad cavity on the face.—Houstonia minima, *Beck, in Sill. jour.* 10. *p.* 262.

Banks of rivers and prairies of the South Western States. Near St. Louis, Missouri, *Beck, Dr. Engelmann!* New Orleans, *Nuttall!* Arkansas and Western Louisiana, *Nuttall! Dr. Pitcher! Dr. Hale!* March–May.—Plant less than an inch high when it begins to flower; when old 3–4 inches high, the peduncles becoming axillary or alar. Leaves 4–5 lines long, scarcely a line wide. Corolla rose-color or pale purple, large for the size of the plant, but smaller than in H. cærulea; the tube narrowed at the base, as long as the semiovate-oblong lobes, at length about thrice the length of the calyx-segments. Seeds 10–15 in each cell; the cavity of the face wider than in the following, with a longitudinal central ridge.

2. *H. cærulea* (Hook.): annual or biennial, glabrous; stems numerous, erect or spreading, dichotomous; leaves oval-spatulate or oblanceolate, the radical and lower ones tapering to the base or somewhat petioled, usually minutely ciliate; peduncles filiform, elongated, spreading; capsule very broadly obcordate, free above the middle; seeds roundish, scrobiculate.—*Hook.! fl. Bor.-Am.* 1. *p.* 286; *Darlingt. fl. Cest. p.* 104; not of *Wight & Arn.* Houstonia cærulea, *Linn.! spec.* 1. *p.* 105; *Bot. mag. t.* 370; *Pursh, fl.* 1. *p.* 106; *Ell. sk.* 1. *p.* 192; *Torr.! fl.* 1. *p.* 172; *Bart. fl. Amer. Sept. t.* 34, *f.* 1. H. pusilla, "*Schœpf, it.* 2. *p.* 306"; *Gmel. syst.* 1. *p.* 236. H. Linnæi *α.* elatior, *Michx.! fl.* 1. *p.* 85. Chamæjasme inodora &c. *Pluk. alm. t.* 97, *f.* 9.

β. minor: smaller; the branches and peduncles divaricate or spreading; flowers smaller.—*Hook. l. c.* Houstonia Linnæi *β.* minor, *Michx. l. c.* H. patens, *Ell. l. c.*

Canada! (from lat. 48°) to Louisiana! on grassy banks, wet rocks &c. *β.* Mostly in dry soil throughout the Southern States! April–(Feb. or March

in the Southern States) Sept.—Stems 3–6 inches high, branching from the base, sparingly dichotomous. Radical leaves often minutely hispid on the surfaces as well as the margin, usually 3–5 lines long. Peduncles 1–2 inches long in fruit. Corolla 4–5 lines long (in β. often much smaller), blue or blue and white (sometimes all white), with a yellowish throat; the tube 3 or 4 times longer than the oblong-lanceolate calyx-segments; the lobes somewhat ovate and acute, shorter than the tube. Capsule, when mature, more than half free, dehiscent down to the calyx. Seeds 8–15 in each cell; the cavity of the face circular.—*Dwarf Pink. Bluets.*

3. *H. serpyllifolia:* perennial, nearly glabrous; stems numerous or cæspitose, filiform, procumbent or creeping, elongated; leaves roundish-ovate, abruptly narrowed into a petiole, often slightly cordate, ciliolate; peduncles terminal, very long; lobes of the corolla about the length of the tube.—Houstonia serpyllifolia, *Michx.! fl.* 1. *p.* 85; *Pursh! fl.* 1. *p.* 106. H. tenella, *Pursh, l. c.*

About springs, on the high mountains of Carolina, *Michaux! &c.* Mountains of North Carolina, *Mr. M. A. Curtis!* May.—The filiform stems, in the specimens of Mr. Curtis, are 6 to 10 inches long; and the plant has quite the habit of Arenaria Balearica, as Michaux has remarked: the leaves, including the slender petioles, do not exceed 3 lines in length; the peduncles 1–2 inches long; the corolla about as large as in H. cærulea, with the lobes broadly oval. We know not whether the root is really perennial. From the same region, Mr. Curtis has sent us specimens of H. cærulea (apparently), with the leaves nearly of the same shape and almost as distinctly petioled, but they belong to a much stouter and nearly erect, or diffuse plant.—The prior Hedyotis serpyllifolia of Poiret, is referred to H. trinervia by Wight & Arnott.

4. *H. rotundifolia:* perennial; stems branched, creeping; leaves roundish or broadly oval, ciliate when young, thickish, abruptly narrowed into a short petiole; peduncles axillary and shorter (and sometimes terminal and longer) than the leaves; capsule free above the middle, very broad, emarginate, few-seeded; seeds roundish, scrobiculate.—Houstonia rotundifolia, *Michx.! fl.* 1. *p.* 85; *Pursh! l. c.; Ell. l. c.* Panetos rotundifolia, *Raf.* Anonymos procumbens, *Walt. Car. p.* 86. Poiretia procumbens, *Gmel. syst. p.* 263. Anotis (Panetos) rotundifolia, *DC.! prodr.* 4. *p.* 433.

Sandy soil, S. Carolina! to Florida! and Louisiana! flowering nearly all the year.—Leaves persistent, at length nearly glabrous, about half an inch long. Flowers (white *Ell.*) about as large as in H. cærulea; the peduncles nodding in fruit. Lobes of the corolla shorter than the slender tube. Capsule splitting almost to the base.—The Hedyotis rotundifolia of Sprengel is also referred to H. trinervia.

§ 2. *Corolla infundibuliform, often hairy or villous inside; the tube longer than the teeth of the calyx, which are distant in fruit: stamens and style diœcio-dimorphous, and alternately included or more or less exserted (as in* § 1*): anthers linear: capsule subglobose or ovoid, the upper half free from the calyx: seeds rather few* (4–15 *in each cell*) *oval, with a deep hollow on the face: small erect perennial herbs, often corymbosely branched; stipules entire: flowers in terminal di-trichotomous cymules.*—AMPHIOTIS, DC.* (§ of Anotis.)

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* In De Candolle's sectional character, the phrase "Corollæ hypocraterimorphæ" occurs: but the only species of the section is said to have an *infundibuliform* corolla.

5. *H. purpurea:* stems erect or ascending, tetragonal, pubescent (at least when young) with spreading hairs; leaves ovate or ovate-lanceolate, closely sessile, 3–5-nerved from the base, glabrous or sprinkled with scattered hairs above, the veins of the lower surface and margins pubescent; umbelliform cymules 3–7-flowered, often clustered; lobes of the calyx subulate-linear, three or four times the length of the tube, and manifestly longer than the subglobose capsule.—H. umbellata, *Walt. Car. p.* 85? Houstonia purpurea, *Linn.! spec.* 1. *p.* 105; *Pursh! fl.* 1. *p.* 167; *Ell. sk.* 1. *p.* 193; *Torr.! fl.* 1. *p.* 173. H. varians, *Michx.! fl.* 1. *p.* 86, in part. H. pubescens, *Raf. in med. repos.* (*hex.* 2) 5. *p.* 361? Anotis lanceolata, *DC. prodr.* 4. *p.* 433?

β. lobes of the calyx lanceolate-linear, almost equalling the corolla; leaves lanceolate.—Houstonia macrosepala, *Nutt.! mss.* Hedyotis lanceolata, *Poir. suppl.* 3. *p.* 14?

Woods and river banks, Maryland! Virginia! Western Pennsylvania, and Ohio! to Alabama! Tennessee! and Missouri! May–July.—Stems usually several from the same root, branching, about a foot high. Leaves 1–2 inches long, in size and shape not unlike those of Galium circæzans, rounded at the base, rather acute; varying however to lanceolate; the upper surface either hairy or glabrous. Stipules ovate, scarious. Corolla purple, about 4 lines long, slightly hairy inside; the tube usually longer than the lobes of the calyx. Stamens all exserted in some specimens, all included in others; the filaments in the former case coherent with the tube of the corolla to the summit, but they may sometimes be partially detached without laceration. Capsule free only at the summit; the cells several-seeded.

6. *H. ciliolata* (Torr.): stems usually numerous and somewhat cæspitose, nearly glabrous; leaves rather thick, obscurely 1-nerved; the cauline ones oblanceolate or linear-oblong, mostly obtuse, sessile, minutely ciliate; the radical and lowest cauline ones oval-spatulate, tapering into a petiole, ciliate with rigid hairs; cymules mostly 3-flowered, in corymbose clusters; peduncles and pedicels short; lobes of the calyx lanceolate-subulate, about the length of the subglobose capsule.—*Torr.! in Spreng. cur. post. p.* 40; *DC. prodr.* 4. *p.* 422; *Hook. l. c.* Houstonia ciliolata, *Torr.! fl.* 1. *p.* 174. H. Canadensis, *Muhl. in herb. Willd.!* H. serpyllifolia, *Graham, in bot. mag. t.* 2882, not of *Michx.*

Banks of rivers and lakes, Canada (*Pursh!* in *herb. Lamb.*), Michigan! Falls of Niagara! and on the shore of Lake Ontario! nearly confined to limestone formations. Kentucky, *Dr. Short!* May–July.—Stems 4–6 inches high, often with slightly margined angles. Radical leaves in rosulate tufts, somewhat coriaceous; the cauline pairs rather few and distant, shorter and broader than in H. longifolia: the flowers much more numerous than in that species, clustered, lilac or pale purple. Stipules scarious, roundish, rather large. Calyx-lobes about half the length of the tube of the corolla. Capsule about half free; the cells 8–9-seeded.

7. *H. longifolia* (Hook.): glabrous; stems erect, 4-angled with decurrent lines; leaves linear or oblong-linear, acute or obtuse, tapering to the base, 1-nerved; the radical ones oval or oblong, narrowed into a petiole; cymules 2–3-flowered, somewhat paniculate; the pedicels at first short, at length nearly equal and longer than the fruit; lobes of the calyx subulate-lanceolate, mostly longer than the tube, but shorter than, or scarcely exceeding, the subglobose capsule.—*Hook.! fl. Bor.-Am.* 1. *p.* 286. (excl. syn. *Michx.*) Houstonia longifolia, *Gærtn. fr.* 1. *p.* 226, *t.* 49, *f.* 8 (fruit); *Willd.! spec.* 1. *p.* 583; *Ell. l. c.*; *Torr.! l. c*; *Bigel. fl. Bost. ed.* 2. *p.* 53; *Hook. bot. mag. t.* 3099. H. angustifolia, *Pursh! fl.* 1. *p.* 106, not of *Michx.*

β. tenuifolia: stem and numerous divaricate branches very slender;

peduncles and pedicels filiform; flowers small.—Houstonia tenuifolia, *Nutt. gen.* 1. *p.* 287.

Shady banks &c., Canada! (from the Saskatchawan) and Northern and Western States! to the upper and middle country of the Southern States! *β.* Ohio! and mountains of N. Carolina! and Tennessee to Arkansas! June–July.—Stems 5–10 inches high, usually numerous from the same root, obscurely 4-sided, but with the angles, or 2 of them, margined with very narrow sharp decurrent lines. Leaves 9–15 lines long, 2–3 lines broad, glabrous, or the margins very slightly scabrous. Stipules scarious, small, ovate or triangular. Flowers rather smaller than in the preceding, pale purple or nearly white. Corolla much longer than the lobes of the calyx. Capsule nearly half free; the cells about 10-seeded. Stamens and style varying inversely, as in the preceding species.—This is probably distinct from H. purpurea, the narrow-leaved forms of which sometimes approach it very nearly; although the length of the calyx-lobes is perhaps not absolutely invariable. It seems to pass insensibly into the H. tenuifolia, *Nutt.*; which is, however, a remarkably slender plant, with more distant narrowly linear leaves, and very slender and spreading branches and pedicels, the latter several times longer than the (about 8-seeded) fruit.

8. *H. stenophylla:* slightly suffruticose at the base, glabrous; stems erect or assurgent, much branched; leaves very narrowly linear, often with smaller ones fasciculate in the axils, 1-nerved, acute, tapering to the base; flowers very numerous, in 3–4 times di-trichotomous cymules, corymbose at the extremity of the branches; pedicels short, the central flower of each cluster almost sessile; lobes of the calyx subulate, as long as the tube; capsule turbinate.—Houstonia angustifolia, *Michx.! fl.* 1. *p.* 85. (not Hedyotis angustifolia, *Cham. & Schlecht.*) H. fruticosa & H. rupestris, *Raf.! monogr. Houst. in ann. gen.* 1820. (not Hedyotis rupestris, *Swartz.*)

Banks of rivers, and prairies; sea-coast of Florida, *Michaux!* (Georgia? *Elliott!*) to Kentucky! Missouri! Louisiana! Arkansas! and Texas! June–July.—Stem 10 inches to 2 feet high. Leaves an inch or more in length. Flowers very numerous, usually fastigiate-corymbose, pale purple: the tube of the corolla thrice the length of the calyx-teeth (which are furnished with a few very minute bristly hairs); the oblong segments and throat very villous inside. Filaments and style either exserted or included inversely, as in the other species of the section. Capsule small, acute at the base; the summit only free. Seeds 5–10 in each cell, oval, black.—Readily distinguished by its turbinate fruit. In the other species of this section, the pedicels (2–7) are equal or nearly so, and more or less elongated in fruit: in this, the central flower of each cymule is nearly sessile.

§ 3. *Corolla rotate, much shorter than the lanceolate teeth of the calyx, which are spreading and with the sinuses acute in fruit: stamens and style very short: anthers roundish-ovate: capsule ovoid, wholly coherent with the tube of the calyx, loculicidally dehiscent across the summit: seeds very numerous and minute* (50–60 *in each cell*), *angular: herb perennial, with the habit of* Spermacoce *or* Diodia: *stipules mostly bimucronate or bisetose on each side: flowers solitary or* 3–4 *together in the axils of the leaves, almost sessile.*—DIODELLA.

9. *H. Boscii* (DC.): herbaceous, or suffrutescent at the base, much branched, diffuse, glabrous; branches slender; leaves linear, acute at each end, obscurely 1-nerved; stipules very small; flowers on very short pedicels; teeth of the calyx triangular-subulate, spreading or recurved, shorter

than the slightly compressed roundish-ovoid fruit.—*DC.! prodr.* 4. *p* 420; *Hook.! compan. to bot. mag.* 1. *p.* 48.

Borders of ponds and streams, and in open grounds, Carolina (*Bosc!*) to Louisiana, *Tainturier! Drummond! Dr. Carpenter!* Alexandria, *Dr. Hale!* and on the banks of the Sabine, *Dr. Leavenworth!* July–Sept.—Stems 6–10 inches long. Leaves about an inch in length. Flowers minute; the fruit scarcely more than a line long, minutely scabrous, crowned with the rather short calyx-teeth. Corolla (purplish, *Leavenworth*,) with scarcely any tube. The plant turns blackish in drying.—Somewhat intermediate between the sections Scleromitrion & Oldenlandia of Wight & Arnott.

§ 4. *Corolla rotate, much shorter than the teeth of the calyx, which are erect in fruit, with the sinuses acute: stamens scarcely longer than the lobes of the corolla: anthers subglobose: style nearly none: stigmas oblong, obtuse: capsule globose-compressed, wholly coherent with the tube of the calyx, emarginate, loculicidally dehiscent across the summit: seeds very numerous and minute* (60 *or more in each cell*), *angular: herb annual, with the habit of* Elatine: *stipules bisubulate on each side: flowers solitary or mostly glomerate in the axils of the leaves.*—ELATINELLA.

This and the preceding sections should probably be considered mere divisions of the subgenus Oldenlandia, whenever that group shall be definitely characterized.

10. *H. glomerata* (Ell.): stems diffuse or somewhat erect, hirsute-pubescent, branching: leaves oblong or elliptical-lanceolate, narrowed at the base, or slightly petioled, nearly glabrous; flowers mostly glomerate in the axils; tube of the calyx hirsute, shorter than the ovate or oblong foliaceous lobes.—*Ell. sk.* 1. *p.* 187; *Torr.! fl.* 1. *p.* 171; *DC.! prodr.* 4. *p.* 421. H. auricularia, *Walt. Car. p.* 85, not of *Linn.* H. uniflora, *Lam.?* H. glomerata & H. Virginica, *Spreng. syst.* 1. *p.* 412. Oldenlandia uniflora, *Linn.! spec.* 1. *p.* 119. O. glomerata, *Michx.! fl.* 1. *p.* 83; *Pursh, fl.* 1. *p.* 102.

Margin of swamps, and especially brackish marshes, New York! and New Jersey! to Florida! and Louisiana! June–Oct.—Stem 2–18 inches high. Leaves half an inch to an inch long, often slightly pubescent, somewhat 3-nerved at the base, slightly veiny. Stipules on each side cleft nearly to the base into 2 subulate divisions, which are as long as the petioles or narrowed base of the leaves. Flowers small, seldom solitary or three together, and then pedicellate, usually in small dense clusters. Corolla many times shorter than the limb of the calyx, white; the lobes semiovate. The plant does not turn blackish in drying.

§ 5. (An gen.?) *Flowers pentamerous: corolla infundibuliform, 5-lobed, somewhat longer than the* 5 *lanceolate-subulate teeth of the calyx, which are erect in fruit, with the sinuses obtuse; stamens* 5, *included, inserted towards the base of the corolla: anthers oblong: style as long as the stamens: capsule turbinate, wholly coherent with* (*and rather shorter than*) *the tube of the calyx, loculicidal at the summit: placentæ pedicellate from the middle of the septum, horizontal: seeds very numerous, angular: herb perennial, dichotomous: stipules* 2–4-*subulate on each side: flowers axillary, somewhat cymulose.*—PENTOTIS.

11. *H. Halei:* glabrous; stem diffuse, dichotomous; leaves oval-oblong,

somewhat fleshy, rather acute, narrowed into a slight petiole; cymules 3–5-flowered, scarcely pedunculate; shorter than the turbinate capsule.

Red River, near Alexandria, Louisiana, *Dr. Hale!*—Stems 8–10 inches long, branched from the base. Leaves an inch to an inch and a half long, half an inch broad, shining underneath. Stipules broad, connate with the petioles, membranaceous, truncate, with 2–4 short subulate appendages on each side. Pedicels scarcely longer than the calyx. Corolla white, about twice the length of the calyx-teeth. Lobes of the stigma linear-oblong, hairy. Seeds minutely roughened.—This plant appears to accord with Hedyotis (Oldenlandia), except in its pentamerous flowers.

Houstonia grandiflora, pusilla, & ciliata, *Raf. monogr. Houst., in ann. sci. gen.* 1820, (his subgenus *Edrissa*, which corresponds to Houstonia proper,) are doubtless synonyms of H. cærulea. Houstonia obtusifolia, oblongifolia, and heterophylla, *Raf. l. c.* belong doubtless to H. longifolia and H. ciliolata.

SUBORDER III. LOGANIEÆ. *R. Br.* (Loganiaceæ, *Lindl.*, *Endl.* in part.)

Leaves opposite. Stipules between the petioles, sometimes nearly obsolete. Æstivation of the corolla valvate or convolute. Ovary free from the persistent calyx, or nearly so.—Shrubs or herbs, natives of warm or tropical regions.

In thus appending Logania and its nearest allies to Rubiaceæ (which seems inevitable when we compare Ophiorhiza with Mitreola, a portion of Hedyotis with Cœlostylis, &c.), we trust we are following the indications thrown out by the most profound botanist who proposed the order or tribe (*Appx. to Flinders*, 2. *p.* 564, and *Tuckey's Congo*, *p.* 448); although it is still no less true than when Mr. Brown first made the remark, that there are no satisfactory characters known to distinguish Rubiaceæ from Apocynaceæ.

17. CŒLOSTYLIS. *Torr. & Gr., in Endl. decad., & iconogr. t.* 101.

Calyx deeply 5-parted. Corolla infundibuliform; the limb 5-cleft, valvate in æstivation, the margins slightly reduplicate. Stamens 5, inserted near the middle of the tube, included: anthers oblong-linear. Ovary 2-celled, free from the calyx, seated on a small 2-lobed disk: ovules 10 or more in each cell, peltate, covering the somewhat projecting placentæ, which arise from near the base of each cell: style included: the lower portion solid, persistent; the upper half membranous, tubular, deciduous by an articulation; the summit cylindrical-subclavate, villous with rigid collecting hairs: stigma undivided. Capsule didymous, composed of two subglobose rather coriaceous carpels, which at length separate from each other and from the indurated disk, opening elastically by loculicidal dehiscence. Seeds 6–8 on each globose placenta, wingless, angular, scrobiculate. Embryo nearly the length of the fleshy albumen, almost straight: cotyledons oblong.—Herbaceous, probably perennial plants (natives of Florida and Texas), with somewhat angular· stems. Leaves opposite, ovate or oblong-lanceolate, somewhat veined, slightly petioled, with small entire stipules between the petioles. Flowers small, solitary or somewhat cymulose, axillary, dichotomal, and terminal.

This genus was characterized and published by the accomplished Endlicher, from an insufficient specimen of the Florida plant, the fruit of which is still a desideratum. But a second species of the genus fortunately occurs in Drummond's Texan Collection (*no.* 321 of 3*rd. coll.*), from which we have completed its carpological history. —The venation of the corolla is somewhat curious, although nearly the same as in many Rubiaceæ. There are about 20 primary veins, three of which are continued into each segment and somewhat ramified towards its summit; there is also a vein corresponding with each sinus, occupying the situation of the primary veins in Compositæ, and forked near the sinus in the same manner, one division passing into each segment and coursing near the margin, but disappearing by ramification before it reaches the summit.—The nearest alliance of Cœlostylis is perhaps with Logania § Stomandra, *R. Br.*; from which it differs abundantly in the æstivation of the corolla, and the insertion of the stamens.

1. *C. loganioides* (Torr. & Gr. l. c.): leaves ovate and obovate, somewhat coriaceous; the upper surface with the margins and the summit of the stem somewhat pnberulent-scabrous.

Near Fort King, Florida, *Dr. Burrows !*—Stem, or branches, slender, 6–10 inches long, ascending, glabrous except the upper part and about the nodes, somewhat 4-angled by lines decurrent from the leaves; two of the angles more distinct. Leaves about half an inch long, scarcely petioled, rather obtuse, marked with a few strong oblique veins. Flowers apparently three together at the summit (the central one on a short pedicel), or solitary and axillary. Sepals almost distinct, linear-subulate, less than half the length of the corolla, minutely serrulate under a lens. Corolla about 4 lines long, glabrous, probably white: the lobes ovate-lanceolate, acutish. Filaments scarcely longer than the anthers: pollen triangular. Ovary ovoid. Fruit unknown.

2. *C. Texana:* leaves lanceolate and oblong-lanceolate, membranaceous, glabrous; stem dichotomous at the summit.

Texas, *Drummond !*—Stem ascending, 12–18 inches high, 4-angled with decurrent lines, di-trichotomous at the summit, often bearing 4 leaves in a whorl at the first bifurcation. Leaves 1–2 inches long, 6–8 lines wide, rather acute at each end; the veins few and nearly simple. Stipules ovate, those near the base of the stem almost obsolete. Flowers dichotomal or terminal, solitary or three together; the central ones on very short pedicels. Calyx, corolla, stamens, and style as in the preceding species, except that the hairy portion of the latter is shorter. Capsule about 3 lines wide, composed of two globose glabrous cocci, which cohere by a small portion of their face, separating from each other at maturity, and from the indurated disk, which, with the calyx, remains attached to the summit of the pedicel. Seeds strongly pitted.

18. MITREOLA. *Linn. hort. Cliff.*; *R. Br. prodr.* 1. *p.* 450 (note); *A. Rich. in mem. soc. hist. nat. Par.* 1. *t.* 3.

Ophiorhiza Mitreola, *Linn. spec.*—Cynoctonum, *Gmel.*

Calyx 5-parted. Corolla urceolate-infundibuliform, exceeding the calyx, bearded in the throat; the lobes of the 5-parted limb ovate, 3-nerved. Stamens 5, included, inserted into the lower part of the tube of the corolla: anthers roundish. Ovary 2-celled, coherent with the calyx at the base: styles short, separate at the base, united above: stigmas also united, small. Capsule almost entirely free from the calyx, 2-horned or deeply 2-lobed, mitre-shaped, 2-celled, each lobe dehiscent near the summit by the ventral suture: placentæ stipitate from near the summit of the dissepiment, many-seeded. Seeds very small, oval, anatropous, minutely scrobiculate under a lens. Embryo nearly the length of the fleshy albumen, straight: radicle cylindri-

cal: cotyledons short, ovate.—Annual glabrous herbs (natives of tropical America and the Southern United States), with opposite oval or lanceolate leaves, and very small entire stipules between the petioles. Flowers small, white, in terminal scorpioid cymes.

Mitreola appears to differ from Mitrasacme, *Labill.* chiefly in its pentamerous flowers.—In both species of this genus, and also in Polypremum, the pollen-tubes are often so copious, even in dried specimens, as to fasten the anthers strongly to the stigma.

1. *M. petiolata:* leaves membranaceous, lanceolate or oval-oblong, acute, narrowed at the base into a petiole.—Ophiorhiza Mitreola, *Linn. spec.* 1. *p.* 150; *Swartz, obs. p.* 59, *t.* 3, *f.* 2. O. lanceolata, *Ell.! sk.* 1. *p.* 238. Anonymos petiolata, *Walt. Car. p.* 108. Cynoctonum petiolatum, *Gmel. syst. p.* 4.

Damp shady soil, Virginia! to Florida! and west to the borders of Texas! June–Sept.—Stem 1–2 feet high, somewhat branching. Leaves 1–3 inches long. Peduncles terminal and from the axils of the upper leaves, once or twice dichotomous or trichotomous: the flowers subsessile and unilateral along the somewhat circinate divisions, and solitary in the forks. Bracts minute, subulate, one to each flower. Capsule exactly mitre-shaped; the lobes somewhat flattened anteriorly and posteriorly, slightly pointed, diverging, and then often somewhat convergent near the summit, each opening by a small chink in the ventral suture near the summit.

2. *M. sessilifolia:* leaves firm or slightly coriaceous, ovate or roundish, sessile; the veins conspicuous beneath.—Ophiorhiza Mitreola, *Michx.! fl.* 1. *p.* 148 (partly); *Pursh, fl.* 1. *p.* 139; *Ell.! sk.* 1. *p.* 237. O. ovalifolia, *Muhl. cat. p.* 20. O. Croomii, *Curtis! pl. Wilmingt. in Bost. jour. nat. hist.* 1. *p.* 128. Anonymos sessilifolia, *Walt.! Car. p.* 108. Cynoctonum sessilifolium, *Gmel. l. c.*

β. angustifolia: leaves lanceolate-elliptical, closely sessile, obscurely veined.

Damp shady soil, and wet banks of rivers, South Carolina! Georgia! and Alabama! *β.* Middle Florida, *Dr. Chapman!* June–Aug.—Stem 12–18 inches high, somewhat quadrangular, simple, or sometimes branched from the base, or slightly so at the summit. Leaves half an inch to an inch long, often nearly round, very obtuse at the base, and closely sessile. Stipules very small, those of the lower leaves indistinct. Peduncles and inflorescence, flowers, &c. nearly as in the preceding species, the flowers perhaps closer and more nearly sessile. Æstivation of the corolla slightly imbricated?—We have resumed the specific names of Walter, the first botanist who distinguished the two species. It is Achille Richard, if we mistake not (for we do not possess his paper on the subject), who has proposed the name of M. ophiorhizoides; but, as he has followed Michaux, who considered the two plants as mere varieties, we know not to which species this name, if adopted, should be applied; perhaps to M. sessilifolia, which appears to be the plant Michaux had chiefly in view, while the other species is the original Ophiorhiza Mitreola.

19.? POLYPREMUM. *Linn., in act. Ups.* (1741) *t.* 78; *Lam. ill. t.* 71; *Gærtn. fr. t.* 62; *Juss. in ann. mus. Par.* 5. *p.* 255, & *mem. mus.* 6. *p.* 382; *DC. prodr.* 4. *p.* 435.

Symphoranthos, *Mitch.*

Calyx deeply 4-parted; the divisions subulate from an ovate base, with scarious margins. Corolla somewhat rotate, not longer than the calyx; the

throat bearded; the lobes of the 4-parted limb slightly unequal, oval. Stamens 4, inserted into the tube of the corolla towards the base, included: anthers subglobose. Ovary coherent merely with the base of the calyx, 2-celled: style extremely short: stigma ovoid (large), entire. Capsule ovoid, shorter than the persistent calyx, slightly compressed and didymous, 2-celled, 2-valved, loculicidal: placentæ oblong, ascending from near the base of the dissepiment, many-seeded. Seeds minute, angled, diaphanous. "Embryo straight, in the axis of fleshy albumen." *Gærtn.*—A glabrous dichotomously much branched and diffuse annual herb, rather rigid; with opposite subulate-linear leaves, connected on each side by an obscure stipular membrane. Flowers small and inconspicuous, solitary and sessile in each fork of the branches, and terminal, subtended by one or two pairs of subulate bracts. Corolla white.

P. procumbens (Linn. l. c.)—*Pursh, fl.* 1. *p.* 99; *Ell. sk.* 1. *p.* 200; *DC.! l. c.* P. Linnæi, *Michx.! fl.* 1. *p.* 83.

Dry fields and pastures, Virginia! to Florida! Key West! and Louisiana! May–Sept.—Stems numerous, procumbent or somewhat erect, 6–12 inches long; the angles minutely scabrous. Leaves about an inch long, very minutely serrulate-scabrous on the margins, often fascicled in the axils. Bracts similar to the upper leaves. Sepals with a green and rigid midrib and subulate point, the border broad and scarious. Throat of the corolla densely bearded: the 2 upper? lobes slightly shorter, and perhaps a little divergent from the lower. Stamens equal. Capsule between crustaceous and coriaceous; the placentæ oblong, nearly the length of the cells, covered throughout with the very numerous seeds.

ORDER LXXIV. VALERIANACEÆ. *DC.*

Tube of the calyx adherent to the ovary; the limb various, sometimes forming a plumose pappus, occasionally obsolete. Corolla tubular-infundibuliform or obconical, often gibbous anteriorly or spurred; the limb mostly 5-lobed, imbricate in æstivation. Stamens distinct, inserted into the corolla, sometimes 5, more frequently 3 or 4 (the posterior only, or this and one of the lateral ones being suppressed), rarely 2 or reduced to a single one (the posterior): anthers introrse. Ovary mostly 3-celled, two of the cells empty, the third containing a solitary suspended ovule: style filiform: stigmas 2–3, or united into one. Fruit membranaceous or coriaceous, indehiscent, 1-celled, or frequently 3-celled with 2 of the cells empty, sometimes 2-celled by the confluence of the empty cells, 1-seeded. Seed anatropous, with a membranaceous testa, destitute of albumen.—Herbs or sometimes shrubs; the perennial species with thick and odorous roots or rhizomas. Leaves opposite, exstipulate, simple or divided. Flowers in dichotomous cymes, at first often glomerate, frequently corymbose or paniculate. Corolla white, rose-color, or blue, rarely purple or yellow.

1. VALERIANA. *Tourn.*; *Linn.* (excl. spec.); *Neck. elem.* 1. *p.* 122; *DC. mem. Valer., & prodr.* 4. *p.* 632.

Limb of the calyx involute after flowering, at length evolute, forming a plumose pappus of numerous setæ, deciduous. Corolla obconical, or with a cylindraceous tube, sometimes gibbous, but not spurred at the base; the limb obtusely 5- (rarely 3–4-) cleft, regular. Stamens 3. Fruit 1-celled when mature (with no vestiges of the abortive cells), 1-seeded. Perennial herbs or sometimes shrubby plants, with divided or undivided leaves. Flowers cymose, the dichotomal flowers sessile; the cymules often paniculate or glomerate. Bracts usually opposite. Corolla white, sometimes bluish or rose-color.

Our species are all true Valerians (§ PHU, *DC.*), and are perennial herbs.

* *Stems climbing or twining.*

1. *V. scandens* (Linn.): herbaceous, glabrous, climbing and twining; leaves on slender petioles, ternately divided; the divisions ovate or oblong-ovate, entire, the terminal one largest, mostly acuminate; flowers (small) in dichotomous diffuse or divaricate paniculate cymes, axillary and terminating the branches; corolla very short; fruit glabrous or slightly hairy, 3-nerved on one side, 1-nerved on the other.—*Linn. spec.* (*ed.* 2) 1. *p.* 47; *Willd. spec.* 1. *p.* 180; *DC.! prodr.* 4. *p.* 634.

Florida, *Baldwin! Dr. Leavenworth!*—Stem slender, branching, climbing to the height of 4 or 5 feet. Leaves membranaceous.

* * *Stem erect: root or rhizoma somewhat creeping, fibrillose.*

2. *V. sylvatica* (Herb. Banks.): glabrous; stem slightly striate, simple; radical leaves ovate or oblong-spatulate, entire, or rarely with 2 small auriculate lobes, on slender petioles; cauline ones pinnately divided; the divisions lanceolate or ovate-lanceolate, entire or obscurely serrate, the terminal one larger; flowers all perfect and similar, numerous, in a compact cyme; lobes of the stigma 2–3, minute; fruit ovoid, compressed, glabrous.—*Richards.! in appx. Frankl. journ. ed.* 2. *p.* 2; *Hook.! fl. Bor.-Am.* 1. *p.* 291. V. dioica, *Pursh, fl.* 2. *p.* 727.

β. uliginosa: leaves ciliate; the surface also (as well as the stem) often minutely pubescent; the terminal division frequently toothed.—V. sylvatica? *Beck! bot. p.* 164.

Newfoundland, *Banks!* On Clear-water River, in Subarctic America, *Richardson!* Prairies of the Rocky Mountains, (in about lat. 52° ?) *Drummond!* *β.* In swamps, Fairhaven, Vermont, *Dr. Robbins! Beck! Prof. Tully!* Wayne County, New York, *Dr. Sartwell!* Near Pontiac, Michigan, *Mr. George P. Williams!* June–July.—Root having the odor of V. officinalis. Plant 10–24 inches high. Divisions of the cauline leaves 5–11, varying from oblong-ovate to linear-lanceolate, mostly acute. Corolla short, obconical, gibbous at the base, rose-color.—The flowers of the northern plant (var. *α.*) are no larger than those of V. dioica of Europe (to which Hooker thinks the species is probably too nearly allied); but the plant from the United States, besides the differences already indicated, has rather larger flowers: the cyme, at first glomerate, is at length open and somewhat paniculate. The fruit of the northern plant is unknown to us; in that of the United States it is glabrous, narrowly oblong-ovate, 3-nerved on one side, and 1-nerved on the other. The leaves in the specimens communicated by Mr. Williams are pubescent throughout.

3. *V. pauciflora* (Michx.): glabrous; stem simple, slender, often decumbent at the base and surculose; radical leaves on slender petioles, ovate, cordate, acuminate, crenate-toothed, sometimes ternately divided, with the lateral divisions small; cauline leaves pinnately 3–7-divided; the divisions ovate or oblong-ovate, often petiolulate, acute or acuminate, mostly serrate; cymules few-flowered, paniculate; tube of the corolla long and slender, with a minute gibbosity at the base; fruit elliptical, flat, minutely pubescent along the middle, marked on one side with 3 closely approximate, on the other with 3 distant nerves.—*Michx.! fl.* 1. *p.* 18; *Nutt.! gen.* 1. *p.* 20; *DC. prodr.* 4. *p.* 638.

Along the Alleghany Mountains, from Virginia! to Tennessee! and in the Western States! June–July.—Stem 1–3 feet high. Leaves thin and membranaceous. Corolla pale pink, 8 lines to near an inch in length.

4. *V. capitata* (Willd.): glabrous, or pubescent at the nodes of the erect simple stem; radical and lower cauline leaves on slender petioles, either simple (and ovate or broadly oval, obtuse), or pinnately 3–5-divided; the divisions broadly oval, sinuate-toothed, repand-crenulate, or often entire, the terminal one largest; the upper cauline leaves somewhat sessile, undivided or often ternately parted; the divisions (or leaves) oblong or ovate-oblong, mostly acute, serrate-toothed or entire; cyme glomerate or often capitate; bracts filiform-linear, elongated; corolla gibbous on one side, at first short; the tube at length elongated; fruit ovate-oblong, compressed, very glabrous, 2–3-nerved on one side, 1-nerved on the other.—" *Willd. herb.*; *Kæm. & Schult. mant.* 1. *p.* 257 (under V. sisymbriifolia, by a typographical error)"; *Cham. & Schlecht. in Linnæa*, 3. *p.* 130; *DC. prodr.* 4. *p.* 637; *Hook. & Arn. bot. Beechey*, *p.* 125; *Hook.! fl. Bor.-Am.* 1. *p.* 292.

β. Hookeri: plant larger; cyme more or less expanded.—V. pauciflora, *Hook.! l. c. t.* 101, not of *Michx.* V. Hookeri, *Nutt. mss.* V. Sitchensis, *Bongard, in mem. acad. St. Petersb.* (*ser.* 6) 2. *p.* 145?

Kotzebue's Sound, *Chamisso & Eschscholtz, Lay & Collie!* (*Beechey's Voy.*) Norfolk Sound, *Eschscholtz!* Arctic coast, *Dr. Richardson!* *β.* Moist rocks and islands of the Oregon, *Douglas, Dr. Scouler!* Woods in the Rocky Mountains about lat. 56°, *Drummond.*—Plant 1–3 feet high. Leaves or segments one to nearly 3 inches long, membranaceous, veiny, obtuse or rather acute at each end. Peduncles slightly hairy. Corolla whitish or rose-color, at first about the length of the bracts, in size equal to those of the nearly allied V. tripteris of Europe, gibbous about to the same degree and in the same manner; but the tube at length elongates and becomes slender, and the gibbosity nearly disappears: the fully developed corolla is not more than half the length of that of V. pauciflora.—Like V. tripteris, this species varies with the leaves or divisions toothed or entire: we have never seen them cordate, nor does Hooker represent them thus. Our specimen collected by Eschscholtz, as well as one from Kotzebue's Sound gathered in Capt. Beechey's Voyage and given to us by Dr. Arnott, might as well be referred to the var. *β.*, which we are confident is only a more luxuriant state of the northern plant. It is also a native of Kamtschatka &c. Judging from the description, we should have referred the V. Sitchensis, *Bongard*, without hesitation, to our var. *β.*; but it is said to differ from V. capitata, 'as well in the form of the leaves as in its whole habit.' The root of the Sitcha plant is also said to have a stronger odor than that of V. officinalis, and to be employed medicinally by the natives of the island.

* * * *Stem erect: root fusiform, fleshy: leaves somewhat fleshy.*

5. *V. edulis* (Nutt. mss.): stem very glabrous; leaves all somewhat fleshy, pubescent, petioled; the radical ones linear-lanceolate, entire, or 1–2-pinnately parted, with the lobes divaricate; the cauline deeply pinnatifid,

with linear segments; panicle elongated; the peduncles ternately verticillate; flowers white (*Hook.*); "fruit ovate, compressed, pubescent; the limb of the calyx at length evolved in a plumose crown of about 15 setæ." *Nutt.*—Patrinia ceratophylla, *Hook. fl. Bor.-Am.* 1. *p.* 290.

Interior of Oregon from Wallawallah and Kettle Falls, to the vallies of the Rocky Mountains, *Douglas, Nuttall.*—"Stem about a foot, or in the plains of the Rocky Mountains only 3–4 inches high. Flowers small, white, in paniculated clusters. Leaves thin and membranaceous. Fruit one-celled." *Nutt.*—This is one of the numerous plants, the roots of which furnish food to the aborigines of the country. The thick and fusiform black root, although bitter and apparently pernicious, when baked on heated stones or steamed under ground is converted into a pulpy mass, sweet and rather agreeable to the taste, and not unwholesome. *Dougl., Nutt.*—The following is evidently an allied species.

6. *V. ciliata:* stem very glabrous, striate, simple; leaves somewhat fleshy, glabrous, densely ciliate; the radical ones entire, spatulate-lanceolate, tapering into a slender sheathing base; some of them often pinnately 5–7-parted, with the segments linear or lanceolate; the cauline few (1–2 pairs), sessile, pinnately 3–9-parted; the segments linear; flowers in an elongated compound panicle; corolla very short, obconical-campanulate (greenish-white); fruit ovate, compressed, 3-ribbed on one side, 1-ribbed on the other; limb of the calyx at length evolved in a plumose crown of about 12 elongated setæ.—V. n. sp., *Sullivant! cat. Ohio plants.* Patrinia longifolia, *MacNab, in Edinb. phil. jour.* 19. *p . . ?*

Swamps and wet alluvial prairies, "near Springfield, Ohio, *Mr. Williams,*" *Mr. Sullivant!* Urbana, Ohio, *Mr. Samples!* Milwaukie County, Wisconsin, *Mr. Lapham!* On the Maitland River, near Goderich, Upper Canada, *Mr. J. Macnab* (1834). June.—Root fusiform, often 6 to 12 inches long, resembling that of the carrot in color and appearance, except that it is inclined to become horizontal and branched below, bitter and somewhat aromatic to the taste, mucilaginous. (*Mr. Samples, Mr. Sullivant.*) Stem 1–3 or even 4 feet high in fruit, sometimes leafless. Leaves dark green; the radical ones 4 to 9 inches long, clustered; the veins somewhat parallel, but reticulated. Panicle at length elongated to a foot or more; the primary branches rather remote, elongated; the flowers, as usual in the genus, at first glomerate, but loose in fruit.—The Patrinia longifolia of MacNab was doubtless founded upon a small and immature specimen of this interesting plant. That specific name is pre-occupied in Valeriana.

‡ *Doubtful Species.*

7. *V.* (Phyllactis) *obovata* (Nutt.): stemless; root fusiform; leaves radiating, linear-spatulate, obtuse, hirsute-pilose. *Nutt. gen.* 1. *p.* 21 (under Phyllactis); *Schult. mant.* 1. *p.* 214; *DC. prodr.* 4. *p.* 632.

Bare hills around the Arikaree village, Upper Missouri.—The expanded flowers, fruit &c., unknown. *Nuttall.*—A very doubtful plant.

2. PLECTRITIS. *Lindl. bot. reg. t.* 1095 (§ of Valerianella); *DC. mem. Valer. & prodr.* 4. *p.* 631.

Limb of the calyx truncate, entire, almost none. Tube of the corolla gibbous anteriorly, spurred at the base; the limb 5-cleft, more or less bilabiate. Stamens 3. Stigma capitate. Fruit with a somewhat coriaceous triangular fertile cell; the two empty ones open from top to bottom! each forming an involute wing.—Annual glabrous herbs (natives of Oregon and California),

with the habit of Fedia; the stem simple or sparingly branched. Leaves entire, oblong or obovate-spatulate, sessile. Flowers rose-color, aggregated in verticillate glomerules, or capitate. Bracts subulate, verticillate and involucellate, united at the base.

The flowers are, we believe, all perfect and similar; not monœcious, as stated by De Candolle: the bracts are not multifid, but crowded and verticillate.

1. *P. congesta* (DC.): corolla manifestly bilabiate; the spur (or rather its free portion) small, much shorter than the tube; flowers in an oval or oblong head, or often in verticillate (approximate or rather distant) glomerules.—*DC.! l. c.; Hook.! fl. Bor.-Am.* 1. *p.* 291. P. congesta & P. capitata, *Nutt. mss.* Valerianella congesta, *Lindl.! bot. reg. t.* 1095. V. parviflora, *Dougl. ined.* (var. with smaller flowers and narrower leaves, *Hook.*)

Banks of streams and moist rocks, along the Oregon, from the sea-shore to the Wahlamet, *Douglas! Dr. Scouler! Nuttall, Mr. Tolmie!* May–June.—Plant from 4 inches to 2 feet high. Corolla usually 3 or 4 lines long. Ovary pubescent with short thick hairs, but mostly glabrous when mature, except along the face where it is shielded by the incurved wings.

2. *P. macrocera*: limb of the corolla almost regular, small; the spur (or rather its free portion) thick, longer than the tube; stem slender; flowers capitate.—P. congesta *β. Hook. & Arn.! bot. Beechey, suppl. p.* 349, excl. syn.

California, *Douglas!*—Upper leaves sometimes denticulate. Heads, and especially the flowers, smaller than in the preceding; the lobes of the corolla much shorter. Ovary and fruit nearly or quite glabrous.—In P. congesta, the gibbous portion of the corolla, which we should prefer to call an adnate spur, is coherent with the proper (very slender) tube quite to the base of the latter, whence it is produced into a rather slender, but short horn. In the Californian species, on the contrary, the spur is free from at least the lower half of the filiform tube; but is nearly similar in form, except that the termination is more obtuse.

3. FEDIA. *Mœnch; Gærtn. fr. t.* 86 (excl. spec.); *J. Woods, in Linn. trans.* 17. *p.* 421, *t.* 21.

Fedia & Valerianella, *Mœnch, DC. &c.*

Limb of the calyx toothed and persistent, or obsolete. Tube of the corolla (sometimes gibbous) not spurred; the limb 5-lobed, regular, or slightly irregular. Stamens 2 or 3. Stigma entire, or 2–3-lobed. Fruit 3-celled; two of the cells empty (sometimes confluent into one), the other 1-seeded.—Annual nearly glabrous herbs, more or less dichotomous above. Leaves oblong or linear, sessile, entire, or often toothed or incised near the base. Flowers in glomerate or crowded cymules, white, rose-color, or purple. Bracts opposite, or somewhat involucellate.—*Corn-Salad.*

Our first section is almost exactly intermediate between Fedia and Valerianella of Mœnch and De Candolle; having the corolla of the former, with the fruit, stamens, and stigmas of the latter.

§ 1. *Tube of the corolla long and slender; the limb slightly irregular: stamens* 3: *stigma* 3-*cleft: fruit flattened fore and aft, with a somewhat crescent-shaped transverse section; the empty cells membranaceous, inflated, separated and diverging, larger than the fertile cell.*—SIPHONELLA.

1. *F. longiflora:* tube of the corolla filiform, many times longer than the limb or the ovary; fruit with a nearly orbicular outline, nearly glabrous, minutely 3-toothed at the summit; the teeth which crown the empty cells obscure and incurved; flowers in glomerate cymules; bracts lanceolate, glandularly fimbriate-serrulate; lower leaves oblong-spatulate; the upper linear-oblong, entire.—Plectritis longiflora, *Nutt.! mss.*

Plains of Arkansas, *Nuttall!*—Plant glabrous, 6–12 inches high; the stem several times dichotomous above. Leaves about an inch long. Corolla about half an inch long; the (purplish) filiform tube not at all gibbous, abruptly dilated at the summit into a very small slightly ringent (white) limb. Stamens and style exserted. Empty cells of the fruit separate from top to bottom, almost lateral, much larger than the somewhat cartilaginous fertile cell.

2. *F. Nuttallii:* tube of the corolla slender, twice or thrice the length of the limb, furnished with a small callous gibbosity above the middle; fruit with a nearly orbicular outline, very glabrous, minutely 3-toothed at the summit; flowers in capitate cymules; bracts ovate-lanceolate, glandularly serrulate; leaves entire, short, obovate-spatulate; the uppermost oblong.—Plectritis spathulata, *Nutt.! mss.*

Plains of Arkansas, with the preceding, (which it resembles,) *Nuttall!*—Tube of the (white) corolla shorter, and the limb larger in proportion. Fruit very similar to the preceding, immature in the specimen, flattened, concavo-convex or lunulate.

§ 2. *Corolla with a short tube and a regular limb: stamens* 3*: stigma* 3*-cleft or entire: empty cells of the fruit membranaceous and inflated, or sometimes nerviform.*—VALERIANELLA, Mœnch, DC.

* *Fruit with a gibbous corky or spongy mass at the back of the fertile cell; the empty cells large, sometimes confluent.*—Locustæ, *DC.*

3. *F. olitoria* (Vahl.): fruit compressed, oblique, at length broader than long, glabrous; the calyx teeth obscure or none; the partition between the empty cells often imperfect; radical leaves petioled; flowers pale blue.—*Vahl, enum.* 1. *p.* 19; *J. Woods, in Linn. trans.* 17. *p.* 430, *t.* 24, *f.* 1. (*fr.*) F. cærulea, *Aikin! in Eaton, man. bot.*, under Valerianella. F. radiata, *Bart. compend.?* Valeriana locusta *a.* olitoria, *Linn.* V. olitoria, *Willd. spec.* 1. *p.* 182. Valerianella olitoria, *Mœnch, meth. p.* 493; "*Dufresne, Valer. p.* 56, *t.* 3, *f.* 8"; *DC. prodr.* 4. *p.* 625. V. radiata, *DC. l. c.*; *Darlingt. fl. Cest. p.* 11 (chiefly); not Fedia radiata, *Michx.* V. rhombicarpa, *Aikin! cat. Baltimore plants.*

Fields, Maryland and Virginia, *Dr. Aikin!* New Orleans, *Drummond.* Doubtless introduced from Europe. June.—Plant 4–10 inches high, dichotomous; the angles of the stem pubescent. Upper leaves sparingly toothed at the base, ciliate, as also the bracts. Flowers smaller than in V. radiata, in small glomerules. Stigma of three very small linear-oblong lobes. Transverse section of the fruit elliptical; the spongy mass often nearly as large as the empty cells.

** *Fruit triquetrous, not grooved between the (at length confluent?) empty cells, which form the anterior angle, and are much smaller than the fertile one; the latter not thickened at the back.*—Trigonocœlæ.

4. *F. Fagopyrum:* fruit triangular, with an ovate outline, nearly glabrous when mature, obsoletely 2–3-toothed at the apex; the lateral angles acute, the anterior somewhat obtuse; upper leaves mostly entire and rather acute;

flowers white.—F. radiata, *Torr. ! fl.* 1. *p.* 35, chiefly, not of *Michx.* Valerianella radiata, *Beck, bot. p.* 164, partly.

Swampy shady grounds, Western part of the State of New York! to Michigan! and apparently in Ohio and Kentucky. May.—Stem 6–18 inches high, dichotomous above, nearly glabrous. Leaves an inch or an inch and a half long, slightly glaucous; the lowermost spatulate; the uppermost lanceolate-oblong, frequently but not uniformly acutish. Bracts lanceolate, acute, with slightly scarious scarcely ciliate margins. Corolla larger than in F. radiata, infundibuliform. Stigma thickened, nearly entire. Fruit much larger than in F. radiata, 1½ to 2 lines long, minutely puberulent when young, but glabrous when mature, in shape resembling a grain of buckwheat, acutish, minutely and obtusely 1–3-toothed; the fertile cell more than twice the breadth of the two sterile ones taken together, broad and flat on the back, the transverse section triangular with the anterior angle truncated and excavated for the reception of the sterile cells, filled by the broad seed: the empty cells taken together roundish, membranaceous, with the anterior groove very minute or none; the dissepiment thin, and apparently often disappearing.—A remarkable species in its fruit, which furnishes the chief characters in this genus. We have specimens from Ohio and Kentucky, unfortunately without fruit, which have just the flowers of this plant, but rather larger leaves, all obtuse, inclined to be ciliate, and the upper often toothed at the base: they will doubtless prove to belong to this species.

* * * *Fruit not thickened or corky at the back of the fertile cell; the transverse section somewhat orbicular or crescent-shaped: empty cells as large as or larger than the fertile one, either contiguous or separated.*—Platycœlæ & Selenocœlæ, *DC.*

5. *F. radiata* (Michx.): fruit ovoid, pubescent, obtusely and unequally somewhat 4-angled, slightly 1-toothed at the summit; the empty cells contiguous, but with a rather deep groove between them, rather narrower than the flattish fertile cell; upper leaves often toothed; flowers white.—*Michx.! fl.* 1. *p.* 18; *Vahl. enum.* 2. *p.* 21; *Ell. sk.* 1. *p.* 42. Valeriana locusta *ε.* radiata, *Linn. spec.* 1. *p.* 34? V. locusta, *Walt. Car. p.* 66. V. radiata, *Willd. l. c.?* Valerianella radiata, *Dufresne, l. c.?* (ex syn.), not of *DC.*

β.? leiocarpa: fruit ovoid-oblong, glabrous, the fertile cell rather narrower in proportion.

Low grounds and moist fields, Michigan, *Dr. Pitcher!* to Florida! and Western Lousiana! *β.* North Carolina!—April– (March in the Southern States) May.—Stem 3–12 inches high, often slightly pubescent. Leaves mostly somewhat ciliate; the lower oblong-spatulate; the upper lanceolate-oblong, obtuse, often coarsely toothed towards the base. Bracts lanceolate, slightly ciliate. Flowers in dense cymules, much smaller than in the preceding, white, or bluish-white? Stigma with three short lobes. Fruit scarcely a line long, clothed with a short somewhat deciduous pubescence, slightly grooved on each side between the sterile and the fertile cell, and with a pretty deep open groove between the two former, which however are not at all divergent.—This species is without doubt indigenous; and indeed is quite different from any described foreign species, but it has sometimes been confounded with the introduced F. olitoria. We are uncertain to which the synonym of Clayton should be referred: the character 'floribus albis' applies best to F. radiata; that of 'semine compresso' to F. olitoria.—Our var.? leiocarpa has a narrower as well as smooth fruit, but we dare not consider it a distinct species.

6. *F. Woodsiana:* fruit subglobose-inflated, glabrous, very slightly 1-toothed at the summit; the empty cells separate from top to bottom, diverging, much inflated, their transverse section nearly orbicular, much larger than the fertile cell, which is narrowly oblong and flattened on the back;

upper leaves usually incisely toothed; bracts oval-lanceolate, acute, not ciliate.

Texas, "between Bejar and Austin, *Berlandier*," *DC.* (under Valerianella pumila), *Drummond!*—Habit of F. radiata. Leaves very slightly if at all ciliate. Flowers in small glomerate cymules. Bracts without scarious margins. Corolla very small and short. Stigma with 3 short lobes. Cells of the fruit each very obscurely 1-nerved, and obtuse at the apex; the point of the fertile one slightly produced, but not appearing like a tooth of the calyx.—This apparently very distinct species (allied doubtless to F. pumila, and perhaps also to F. turgida,) we would dedicate to Joseph Woods, Esq. F. L. S., a well-known British botanist, whose admirable memoir entitled "*Observations on the species of Fedia*" (published in the seventeenth volume of the Transactions of the Linnæan Society), has thrown much light upon the European species.

‡ *Doubtful Species.*

7. *F. chenopodifolia* (Pursh): dichotomous; leaves ovate, acute, toothed towards the base; cymes naked, divaricate-dichotomous; filaments long. *Pursh, fl.* 2. *p.* 727.

Virginia, *Herb. Sherard.* ① About a span high; flowers the size of Valeriana officinalis. *Pursh.*

ORDER LXXV. DIPSACEÆ. *Vaill.; DC.*

Tube of the calyx adherent to the ovary, or sometimes free except at the summit; the limb various, sometimes forming a hairy or plumose pappus. Corolla tubular; the limb 5-cleft, or 4-cleft by the union of the two superior lobes; the inferior lobe larger and overlapping the others in æstivation. Stamens 4, inserted into the corolla towards its base (the posterior one suppressed), distinct, or rarely with the filaments united in pairs: anthers introrse: pollen tetrahædal. Ovary 1-celled, with a single suspended ovule: style filiform: stigma simple or 2-lobed. Fruit membranaceous or acheniform, indehiscent, crowned with the limb of the calyx, 1-celled, 1-seeded. Seed anatropous, with a very thin testa which often coheres with the pericarp. Embryo nearly the length of the fleshy albumen.—Herbs or suffrutescent plants (none of them natives of America); with opposite or verticillate sessile leaves, without stipules. Flowers aggregated in a dense involucrate head upon a common receptacle (rarely in dense whorls), each usually subtended by a chaff-like bract, and surrounded at the base by a very short closely appressed monophyllous involucel; the corolla of the exterior flowers often radiant.

1. DIPSACUS. *Tourn.; Linn.; Gærtn. fr. t.* 86; *Coult. Dips. p.* 21, *f.* 2–4, *& in DC. prodr.* 4. *p.* 695.

Flowers capitate; the involucre polyphyllous, longer than the somewhat foliaceous and acuminate chaff of the receptacle. Involucel 4-sided, closely

investing the ovary and fruit. Tube of the calyx coherent with the ovary; the limb cup-shaped or discoid. Limb of the corolla 4-cleft. Stamens 4. Stigma longitudinal.—Biennial erect stout herbs (natives of Europe and Middle Asia), hairy or prickly. Leaves opposite, often connate at the base, undivided or laciniate. Heads large, oblong or roundish; the expansion of the flowers commencing about the middle and proceeding in opposite directions! Corolla pale purple, yellowish, or whitish.

1. *D. sylvestris* (Mill.): stem, with the midrib of the leaves and involucre, prickly, angled; leaves lanceolate-oblong, crenate-toothed; the uppermost lanceolate, mostly entire; leaves of the involucre long and slender, pungent, curved upwards, longer than the oblong head; chaff of the receptacle tapering into a long setaceous flexible awn-like appendage, with a straight point.—*Mill. dict. no.* 2; *Jacq. fl. Austr. t.* 402; *Fl. Dan. t.* 965; *Engl. bot. t.* 1032; *Pursh, fl.* 1. *p.* 96; *Torr.! fl.* 1. *p.* 164; *Darlingt.! fl. Cest. p.* 98.

Fields and road-sides, not uncommon in the Northern and Middle States; naturalized. July–Aug.—Corolla pale purple, pubescent.—*Wild Teasel.*

D. Fullonum, the *Fuller's Teasel*, is sometimes cultivated, but it has never become naturalized in this country.

ORDER LXXVI. COMPOSITÆ. *Vaill.; Linn.; Adans.*

Synantheræ, *Rich.*—Syngenesia, *Linn. sex. syst.*—Compositifloræ, *Gærtn.*

Flowers collected into a dense head (compound flower of the older authors) upon a common receptacle, surrounded by an involucre. Tube of the calyx coherent with the ovary and undistinguishable from it; the limb (called *pappus*) composed of bristles or scales, &c., or very rarely foliaceous, often wanting or reduced to a margin. Corolla composed of mostly 5 united petals; either ligulate or tubular, in the latter case with a valvate æstivation; the tube generally furnished with 5 nerves (or more properly 10 united in pairs), which extend from the base to the sinuses, where they divide, a branch coursing along or near each margin to the apex of the lobes. Stamens as many as the lobes of the corolla and alternate with them: the filaments (distinct or united above) inserted into the tube: anthers linear, coherent by their margins into a cylinder (*syngenesious*). Ovary 1-celled, containing a single erect anatropous ovule: style (usually undivided in the sterile flowers) 2-cleft; the lobes or branches (incorrectly called stigmas) various in form, mostly flattish within, often furnished with collecting hairs; the proper stigmas occupying their inner margins, in the form of glandular slightly prominent lines. Fruit an indehiscent dry 1-seeded pericarp (*achenium*), crowned with

the limb of the calyx or pappus. Seed destitute of albumen. Radicle short: cotyledons flat or plano-convex.—Herbs, rarely shrubs or trees (forming about one-tenth of phanerogamous vegetation); with alternate or opposite sometimes divided or lobed exstipulate leaves. Branches often corymbose, terminated by the heads, the central ones earliest developed. Flowers in each head expanding successively from the margin (or lower portion) to the centre or apex, either all of the same color (*homochromous*), or the marginal ones different from those of the disk (*heterochromous*), the latter in this case almost always yellow; either perfect, polygamous, or diclinous.

There are several terms nearly peculiar to this order, or employed in a particular sense. The head has been termed by different authors the *Calathidium*, *Anthodium*, or *Cephalanthium*; the involucre has received the name of *Common calyx*, *Periclinium*, *&c.*; and the receptacle has been called the *Phoranthium*, *Clinanthium*, or *Rachis*: we have employed none of these terms. The head is said to be *homogamous*, when all the flowers are perfect; or *heterogamous*, when the marginal ones are pistillate or neutral, and the others perfect or staminate: it is termed *discoid*, when the corolla is tubular throughout; *ligulate*, when all the corollas are ligulate; *radiate*, when the marginal ones only are ligulate and the others tubular; and *falsely discoid*, when the corollas are all bilabiate: they are *monœcious*, when the staminate and pistillate flowers occupy the same heads; *heterocephalous*, when they occupy different heads upon the same individual; *diœcious*, when in separate heads upon different individuals. The modified leaves of the involucre are called *scales*. The receptacle, which is the axis of a contracted or depressed spike (and therefore very properly termed *rachis*, by Lessing), is said to be *paleaceous* or *chaffy*, when all the flowers are subtended by chaffy scales (*bracteoles*, Lessing), similar to the innermost scales of the involucre; *semipaleaceous*, when only partly furnished with chaffy scales, and *epaleaceous* or *naked*, when destitute of these scales: it is *alveolate*, when each flower is surrounded at the base with a very short scaly ring or involucel, so as to present an appearance like honey-comb when the achenia are removed; *fimbrillate*, when the margins of the alveoli are irregularly lacerate or bristly; *areolate* when a slight or obsolete, often pentagonal, border or line surrounds the base of each flower. The anthers are usually more or less prolonged at the summit into a membranous appendage (*appendiculate*); and sometimes each lobe or cell bears a subulate or setiform appendage at the base, when they are said to be *caudate*. The achenia are articulated with the receptacle, either sessile or stipitate: they are sometimes *rostrate*, or with the summit prolonged into a beak; in which case the pappus is often, but incorrectly, said to be stipitate.—For the sake of greater convenience in the study of this vast family, we introduce a synopsis of its leading divisions; and give, at the commencement of each tribe, a conspectus of its subdivisions and genera, so far as they are represented in the flora of North America. This is the more necessary, since the student may at first meet with some difficulty in the application of the leading technical characters of the tribes, derived from the form of the styles and stigmas.

CONSPECTUS OF THE TRIBES.

Suborder I. TUBULIFLORÆ.—Corolla of the perfect flowers tubular, and regularly 5- (rarely 3–4-) toothed or lobed.

Tribe I. Vernoniaceæ. Style of the perfect flowers cylindraceous; the branches usually elongated and subulate, hispid throughout; the stigmatic lines not extending beyond their middle. 56

Tribe II. Eupatoriaceæ. Style of the perfect flowers cylindraceous; the branches elongated, obtuse or clavate, externally puberulent or papillose towards the summit; the stigmatic lines obscure, terminating near their middle. 63

Tribe III. ASTEROIDEÆ. Style of the perfect flowers cylindraceous; the branches linear, externally flattish, and minutely and equally pubescent above; the stigmatic lines prominent, extending about to the origin of the exterior pubescence.

Tribe IV. SENECIONIDEÆ. Style of the perfect flowers cylindraceous; the branches linear, truncate at the summit and penicillate, or often produced into a conical or elongated hispid appendage; the stigmatic lines rather broad and prominent, extending to the commencement of the appendage or hairy portion.

Tribe V. CYNAREÆ. Style of the perfect flowers nodose-thickened and often penicillate at the summit; the stigmatic lines not prominent, reaching to and confluent at the summit of the externally puberulent branches.

SUBORDER II. LABIATIFLORÆ.—Corolla of the perfect flowers bilabiate.

Tribe VI. MUTISIACEÆ. Style of the perfect flowers cylindraceous or somewhat nodose above; the branches obtuse or truncate, externally very convex and minutely pubescent above.

Tribe VII. NASSAUVIACEÆ. Style of the perfect flowers not nodose-thickened above; the branches linear, rather long, truncate, penicillate at the summit.

SUBORDER III. LIGULIFLORÆ.—Flowers all perfect and ligulate.

Tribe VIII. CICHORACEÆ. Style cylindraceous above; the branches rather long and obtuse, equally pubescent; the stigmatic lines terminating below their middle.—Plants with milky juice.

SUBORDER I. TUBULIFLORÆ. *DC.*

Corolla of the perfect flowers tubular, and regularly 5- (rarely 4-) toothed or lobed. Pollen globose, echinulate, or (in Cynareæ) rarely smooth and elliptical.

TRIBE I. VERNONIACEÆ. *Less.*

Heads discoid, with the flowers all tubular and perfect (homogamous), or rarely radiate; the ray flowers ligulate and pistillate. Corolla occasionally palmate or obscurely bilabiate. Style cylindrical above; the branches subulate and elongated (rarely short and obtuse), equally hispid; the stigmatic lines terminating below or near their middle, not confluent.

CONSPECTUS OF THE GENERA.

Subtribe 1. VERNONIÆ.—Heads discoid, homogamous.

1. VERNONIA. Heads several–many-flowered. Pappus of hair-like bristles.
2. STOKESIA. Heads many-flowered. Pappus of 4–5 long bristly deciduous scales.
3. ELEPHANTOPUS. Heads 3–5-flowered, aggregated in glomerules. Pappus of several persistent chaffy bristles or awns.

Subtribe 2. PECTIDEÆ.—Heads radiate, heterogamous.

4. XANTHISMA. Corolla of the disk regular. Leaves glandless.
5. PECTIDOPSIS. Corolla regular. Leaves punctate. Pappus coroniform.
6. PECTIS. Corolla of the disk obscurely bilabiate. Leaves punctate with glands. Pappus chaffy and mostly awned.

Subtribe 1. VERNONIEÆ, *Cass.*—Heads discoid; the flowers all perfect. Branches of the style elongated or acuminate.—Leaves mostly alternate. Flowers of the cyanic series, viz., white, blue, purple, or red, but never yellow.

1. VERNONIA. *Schreb. gen. p.* 541; *DC. prodr.* 5. *p.* 15.

Heads several–many-flowered; the flowers all equal and tubular. Involucre imbricate, shorter than the flowers; the inner scales longest. Receptacle commonly naked. Corolla regular; the lobes about the length of the tube. Filaments smooth. Achenia mostly striate or ribbed, with a cartilaginous callus at the base. Pappus usually double; the interior of copious capillary bristles; the exterior mostly short or minute, often somewhat squamellate or chaffy.—Mostly perennial herbs or shrubby plants (chiefly tropical), with usually alternate leaves, and various inflorescence, in the North American species corymbose-cymose. Flowers purple, rose-color, or white.

* *Cauline leaves very few: cyme dichotomous-paniculate.*

1. *V. oligophylla* (Michx.): stem slender, simple, nearly naked above; leaves scabrous, often punctate, pubescent on the veins beneath; the radical ones oval or obovate-oblong, dentate-serrate, narrowed at the base; the cauline (2–4) much smaller, lanceolate, serrulate; heads few, in a loose paniculate or dichotomous cyme, 15–30-flowered; involucre campanulate, much shorter than the mature pappus; the scales with spreading acuminate tips, lanceolate, ciliate; achenia 10-ribbed, nearly glabrous when mature.—*Michx.! fl.* 2. *p.* 94; *Nutt.! gen.* 2. *p.* 134; *Ell. sk.* 2. *p.* 286; *Less. in Linnæa*, 6. *p.* 677; *DC.! prodr.* 5. *p.* 62. Chrysocoma acaulis, *Walt. Car. p.* 196, fide *Pursh.*

Damp pine barrens, N. Carolina! to Florida! June–July.—*4* Stem 1–3 feet high, a little hairy; the root stoloniferous according to Elliott. Exterior scales of involucre loose, subulate, sometimes as long as the inner. Corolla purple.

* * *Stem leafy: cymes corymbose or somewhat umbelliform.*

2. *V. Noveboracensis* (Willd.): stem striate, slightly pubescent; leaves lanceolate or elliptical-lanceolate, sharply serrate, acute at each end, often petioled, glabrous or slightly scabrous above; cyme fastigiate; heads numerous, 20–30-flowered; involucre hemispherical-campanulate, shorter than the pappus; the scales appressed, ovate, mostly produced into a subulate or filiform flexuous appendage; several of the outermost subulate, loose and bracteolate; achenia glabrous or slightly hairy when young, glandular, shorter than the pappus.—*Willd. spec.* 3. *p.* 1632; *DC.! prodr.* 5. *p.* 63. V. prælta, *Less.! in Linnæa*, 4. *p.* 264; *Hook.! fl. Bor.-Am.* 1. *p.* 304; *Darlingt.! fl. Cest. p.* 448. Serratula Noveboracensis, &c. *Linn.! hort. Cliff. p.* 392, *& spec.* 2. *p.* 818.

β. scales of the involucre acute or acuminate, some of them usually with subulate or filiform points.—V. prælta, *Willd.! l. c.* (not of *DC.*) Serratula prælta & glauca, *Linn.! spec. l. c.*

γ. stem, cyme, and lower surface of the leaves tomentose; scales with long filiform points.—V. tomentosa, *Ell. sk.* 2. *p.* 288. Chrysocoma tomentosa, *Walt. Car. p.* 196.

Wet places nearly throughout the United States, especially near the coast and along rivers. July–Aug.—2f Stem 3–6 feet high. Scales of the involucre brownish-purple, mostly ciliate with cobweb-like hairs. Corolla deep purple, rarely pale or pink-color.—*Iron-weed.*

3. *V. Baldwinii* (Torr.): stem and lanceolate serrulate leaves tomentose-pubescent; cyme fastigiate, somewhat crowded; heads 20–30-flowered; involucre subglobose, tomentose and glandular, shorter than the mature pappus, squarrose with the very short recurved acuminate tips of the appressed scales; achenia (immature) puberulent and glandular, shorter than the pappus.—*Torr.! in ann. lyc. New York*, 2. *p.* 211. V. sphæroidea, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 283. (ined.)

On the Missouri, *Baldwin!* Arkansas, *Nuttall!*—2f Plant in some respects intermediate between V. Noveboracensis and V. fasciculata, but probably distinct from both; the heads mostly smaller than in the former.

4. *V. fasciculata* (Michx.): stem striate or grooved; leaves narrowly lanceolate, tapering and acute at each end, serrulate, sometimes puncticulate beneath, often somewhat petioled; cyme fastigiate; the heads numerous, approximate or crowded, 15–30-flowered; involucre hemispherical-campanulate, much shorter than the pappus; the scales all closely appressed, ciliate; the outermost much shorter, acute or mucronulate; the others obtuse, not mucronate; achenia glabrous when mature, and almost the length of the pappus.—*Michx.! fl.* 2. *p.* 94. (not of *DC.*) V. altissima, *Less. in Linnæa*, 6. *p.* 639. V. prælta, *DC.! l. c.* (chiefly, excl. syn. *Dill. Elth.?*); not of *Linn.!* Chrysocoma gigantea, *Walt.?* V. corymbosa, *Schweinitz.! in Long's 2nd exped.*

β. stem and lower surface of the leaves puberulent or almost tomentose; heads rather large; the scales of the involucre mostly very obtuse.

γ. stem and lower surface of the leaves often puberulent; heads small; scales of the involucre sometimes rather acute or mucronulate.—V. altissima, *Nutt.! gen.* 2. *p.* 134; *Ell. sk.* 2. *p.* 289.

δ. nearly glabrous; heads rather small; the scales greenish; flowers nearly white.

Prairies and moist woods, throughout the Western States! and not unfrequent, particularly var. *γ.*, in the Southern States! *β.* Illinois, *Dr. Short!* *δ.* Kentucky, *Dr. Short!* July–Aug.—2f Stem tall (6–12 feet, *Nutt.*) and stout. Cyme usually dense and fastigiate, or sometimes loose and spreading. Flowers (except in var. *δ.*) bright purple. Pappus either pale or purple.—This species varies greatly in the size of its heads, and in the cymes: it is distinguished by its closely appressed and inappendiculate (usually rounded) involucral scales; the tips of which are mostly purple. The leaves, in one of the forms with small loosely disposed heads, are often rather broadly lanceolate, and 6 to 8 inches long.

5. *V. Jamesii:* stem nearly glabrous, striate, corymbose at the summit; leaves (upper ones) narrowly lanceolate, elongated, sessile, glabrous, 1-nerved, entire, both sides puncticulate; cyme corymbose-fastigiate; heads (about 40) 15–20-flowered, rather large; involucre oblong-campanulate or turbinate, acute at the base, shorter than the pappus; the scales all appressed, lanceolate-ovate, acuminate or somewhat mucronate, ciliate; achenia glabrous, shorter than the pappus; the exterior chaffy pappus very indistinct.—V. altissima? *β.* marginata, *Torr.! in ann. lyc. New York*, 2. *p.* 210.

On the Arkansas? *Dr. James!*—The specimen is imperfect, consisting only of a branch or the summit of a stem; but it is abundantly different from any other N. American species. The heads are half an inch in length, more elongated than usual; the scales bordered with an arachnoid web, as in many other species, and greenish, with reddish tips. The corymbose branches of the inflorescence bear 3 to 7 heads, which are mostly on slender pedicels.

6. *V. angustifolia* (Michx.): stem slender, simple or branched, hairy below; leaves numerous, sessile or nearly so, linear or narrowly lanceolate, often pubescent especially on the midrib beneath; the lower remotely serrulate; the uppermost with revolute margins, mostly entire; cyme corymbose or somewhat umbelliform, often simple; heads 15–25-flowered; involucre campanulate, shorter than the pappus; the scales ovate or lanceolate, the exterior mostly loose and bracteolate, either mucronate or furnished with subulate or filiform points; achenia minutely hispid on the ribs, much shorter than the pappus.—*Michx.! fl.* 2. *p.* 94.

a. upper leaves slender, very narrowly linear, entire, glabrous or scabrous (scales of the involucre either appendiculate or merely mucronate).—V. angustifolia, *Ell. sk.* 2. *p.* 287; *Less. l. c.*; *DC. prodr.* 5. *p.* 63. V. fasciculata, *DC.! l. c.*, not of *Michx.* Chrysocoma graminifolia, *Walt.! Car. p.* 196.

β. leaves lanceolate or linear, short, scabrous, especially above; the lower ones serrulate; scales of the involucre mostly appendiculate.—V. scaberrima, *Nutt.! gen.* 2. *p.* 134; *Ell. l. c.*; *Less. l. c.*; *DC.! l. c.*

γ. leaves lanceolate or linear-lanceolate, elongated, very scabrous above; the lower ones remotely serrulate; cymes often compound; scales of the involucre nearly inappendiculate.

Dry pine woods, N. Carolina! to Florida! (*a.* & *β.*) *γ.* Louisiana, *Dr. Hale!* Texas, *Drummond!* June–Aug.—2f Stem 1–3 feet high. Cyme bearing 5-many (small) heads, either simple or compound, loose. Scales of the involucre few. Pappus white or purplish. Corolla bright purple. Achenia often glandular.—The lower leaves of the most narrow-leaved form are veiny, as in the other varieties; while the upper ones, being very narrow, are only one-nerved. The original specimens of both V. angustifolia, *Michx.*, and V. scaberrima, *Nutt.*, belong, if we mistake not, to precisely the same form of this species. No reliance can be placed upon the appendages of the involucral scales.

7. *V. ovalifolia:* stem simple, pubescent below, corymbose at the summit; leaves oval or lanceolate-oblong, acute, sessile, sharply serrate, veiny, nearly smooth and glabrous; cyme corymbose-fastigiate, loose; the heads about 20-flowered; involucre campanulate, much shorter than the pappus; the scales ovate, appressed, mostly acute or somewhat mucronate; achenia a little hairy, much shorter than the pappus.

Middle Florida, *Dr. Chapman!* also near Fort King, *Mr. Alden!*—Stem apparently 3–4 feet high, and rather stout, terete, finely striate above. Leaves 3–4 inches long, and 1–2 or more wide. Heads rather numerous; the involucre and flowers much resembling those of V. angustifolia, but mostly larger. Achenia glandular between the ribs: pappus purplish.

8. *V. Arkansana* (DC.): nearly glabrous; stem stout, simple, striate; leaves numerous, lanceolate-linear, acute at each end, obscurely veined, serrulate, punctate, especially above; heads 6–10, in a simple umbelliform cyme, the central one nearly sessile, subglobose, 50–60-flowered; involucre nearly as long as the pappus; the scales very numerous, lanceolate, pubescent and glandular, with spreading or squarrose subulate tips; achenia strongly 10-ribbed, puberulent and minutely glandular, nearly the length of the pappus.—*DC. prodr.* 7. *p.* 264.

Arkansas, *Nuttall! Dr. Pitcher!*—The plant of De Candolle (which was raised in the Geneva garden from seeds collected in Arkansas by Mr. Pourtales) appears to be the same with ours. But he does not mention the size of the heads, which in our plant when in fruit are nearly an inch in diameter, and then depressed-globose; and the pedicels are remarkably thickened at the summit. Corolla violet-purple. Exterior pappus short, but copious.

2. STOKESIA. *L'Her. sert. Angl. p.* 27; *DC. in ann. mus. Par.* 16. *p.* 154, *& prodr.* 5. *p.* 71; *Cass. dict.* 51. *p.* 64.

Heads many-flowered; the exterior flowers much larger and assuming the form of a ray. Involucre subglobose, bracteate at the base, imbricated in several series, appressed; the exterior scales with a somewhat spreading foliaceous ciliate-spinulose appendage; the inner oblong, somewhat ciliate. Receptacle fleshy, naked. Corolla palmate, sprinkled with resinous globules; the marginal ones much deeper cleft within. Anthers included. Branches of the style semi-subulate. Achenia short, 4-sided (rarely 3-sided), glabrous, terminated with a broad quadrangular areola. Pappus of 4–5 elongated rather rigid awn-like (white) chaffy scales, deciduous.—An erect somewhat branching perennial herb; with a tomentose stem, and large heads, resembling a Carthamus or Centaurea, terminating the branches. Leaves alternate, oblong-lanceolate, glabrous or slightly glaucous, minutely glandular-punctate, entire; the uppermost sessile and serrate-spinulose near the somewhat dilated base; the lower tapering into a margined petiole; the involucrate bracts resembling the upper leaves. Flowers blue, showy.

S. cyanea (L'Her.! l. c.)—*Ait.! Kew.* (*ed.* 2) 4. *p.* 491; *DC.! l. c.* "Carthamus lævis, *Hill, Kew.* 57. *t.* 5." C. Carolinianus, *Michx.! in herb. mus. Par.* Cartesia centauroides, *Cass. in bull. philom.* 1816, *p.* 198.

S. Carolina, "introduced into England by Mr. James Gordon about the year 1766." *Hort. Kew.* "Georgia, *Mr. Tatnall*," *in herb. Nutt.!* Covington, Louisiana, *Drummond!*—This is one of the rarest plants of the United States. It is, or recently has been, cultivated in Mr. Buist's garden at Philadelphia. The plant collected by Drummond is inadvertently called Centaurea Americana, in the account of his United States collections, in *Comp. to bot. mag.* 1. *p.* 48.

3. ELEPHANTOPUS. *Linn.; Gærtn. fr. t.* 165; *Endl. gen. p.* 362.

Heads 3–5-flowered, aggregated into terminal or axillary glomerules; the flowers all equal and similar. Involucre compressed; the scales about 8, in 2 series, dry, oblong, alternately plane and conduplicate; the interior usually 3-nerved. Receptacle naked or obscurely alveolate. Corolla palmate (one of the sinuses being more deeply cleft than the others); the segments acuminate. Filaments smooth. Branches of the style semi-subulate. Achenia oblong, somewhat compressed, many-ribbed, hairy. Pappus in one or two rows of several chaffy bristles, dilated at the base.—Erect perennial herbs, with alternate mostly sessile feather-veined leaves. Corolla violet-purple.

§ *Pappus in a single series; the bristles straight and equal: glomerules terminating the branches, somewhat corymbed, involucrate.*—ELEPHANTOPUS, Cass., Less., DC.

1. *E. Carolinianus* (Willd.): stem hairy, corymbosely branched above; leaves somewhat hairy and scabrous; the radical ones ovate or obovate-oblong, crenate-serrate, tapering into a long margined petiole; the cauline ob-

long or lanceolate; the floral ones ovate-oblong, or cordate-ovate (usually longer than broad).—*Willd. spec.* 3. *p.* 2390 (excl. syn.); *Nutt.! gen.* 2. *p.* 187; *Ell. sk.* 2. *p.* 480; *Less. in Linnæa*, 4. *p.* 324; *DC.! prodr.* 5. *p.* 86. E. scaber, *Michx.! fl.* 2. *p.* 148; not of *Linn.*, except as to syn. *Gronov.*

In dry soil, Pennsylvania! to Florida! and Louisiana! July–Sept.—Stem about 2 feet high. Leaves membranaceous; some of the floral leaves often oblong, and longer than the glomerules.

2. *E. tomentosus* (Linn.): stem hirsute, nearly naked, simple, sparingly dichotomous and corymbose at the summit; leaves villous-tomentose beneath, hirsute-pubescent above; the radical ones large, obovate or oblong-spatulate, obtuse, crenate, narrowed at the base, sessile; the floral ones broadly ovate or cordate; scales of the involucre rigid.—*Linn.! spec. ed.* 1. *p.* 814, & *ed.* 2. *p.* 1314, excl. syn. *Browne*; *Pursh, fl.* 2. *p.* 582; *Less. l. c. p.* 326. E. nudicaulis, *Ell. sk.* 2. *p.* 481; *Poir. suppl.* 2. *p.* 543; *Hook. compan. to bot. mag.* 1. *p.* 96; *DC.! l. c.* E. Carolinianus *β.* simplex, *Nutt. gen.* 2. *p.* 187.

S. Carolina! to Florida! Alabama! Louisiana! and Arkansas! July–Sept.—Stem 1–2 feet high, naked, or sometimes with a single leaf below, resembling the radical ones, and a small lanceolate leaf at each bifurcation of the corymb; the floral leaves very broad, about the length of the glomerules, villous-tomentose, or somewhat silky. Glomerules large. Heads larger, and the scales more pubescent and rigid than in the preceding species.—This is the original E. tomentosus of Linnæus, as appears from the specimen of Clayton. It is more nearly allied to E. scaber than to E. Carolinianus, and Hooker thinks it is identical with the East Indian species. We know not how it is to be distinguished from that species, except by its larger and usually broader tomentose leaves, and more hairy involucre; and we have received from Western Louisiana a plant which exactly accords with the East Indian E. scaber.

3. *E. scaber* (Linn.): stem somewhat dichotomous or corymbose above, more or less hirsute; leaves somewhat pubescent or hairy and scabrous; the radical ones cuneiform-spatulate or oblanceolate, crenulate, tapering to the base, often petioled; the cauline few and small, lanceolate; the floral ones cordate-ovate, hairy.—*Linn. l. c.* excl. syn. *Gronov. &c.* (*Dill. Elth. t.* 106); *Less. l. c.*; *DC.! prodr.* 5. *p.* 86.

Near Alexandria, Louisiana, *Dr. Hale!*—Stem slender, 12–18 inches high, with only 2 or 3 very small cauline leaves; the radical ones about 6 inches long, an inch or a little more in width towards the summit, slightly scabrous and pubescent. Glomerules small.—The plant exactly accords with specimens from China and the peninsula of India. We can make little use of Lessing's character derived from the venation of the floral leaves and scales of the involucre.

Subtribe 2. PECTIDEÆ, *Less.*—Heads radiate. Branches of the style in the perfect flowers obtuse.—Leaves usually opposite. Flowers of the xanthic series (mostly yellow).

4. XANTHISMA. *DC. prodr.* 5. *p.* 94.

Heads many-flowered; the ray-flowers (neutral? or pistillate?) entire; those of the disk perfect. Involucre hemispherical; the scales imbricated, appressed, coriaceous, nearly oval, very obtuse. Receptacle fimbrillate; the fimbrillæ lacerate, about the length of the achenium. Corolla of the disk

5-cleft, regular; the lobes erect. Anthers not caudate. Style of the ray short and simple, included within the tubular part of the corolla; that of the disk 2-cleft at the summit; the branches included, linear, obtuse, slightly and minutely hispid. Achenia obovate, scarcely angled, pubescent. Pappus composed of elongated unequal acuminate chaff; the outermost rather shorter and narrower.—An annual or biennial erect glabrous herb, with a simple stem, loosely branched or corymbose at the summit; the branches erect and leafy. Cauline leaves alternate, rather rigid (not dotted with glands nor fringed with bristles), sessile, oblong or linear, 1-nerved, chiefly entire, sometimes acutely serrate at the summit. Flowers yellow. *DC.*

X. Texanum (DC. l. c.)

Texas, *Berlandier*; in woods.—Habit of Centaurea cerinthefolia. *DC.*—This plant is wholly unknown to us: it is perhaps from the southern part of Texas, and scarcely within the limits of this work.

5. PECTIDOPSIS. *DC. prodr.* 5. *p.* 98.

Heads many-flowered; the flowers of the ray in a single series, ligulate, pistillate; those of the disk perfect, tubular. Involucre cylindrical-campanulate; the scales about 8, in a single series, somewhat conduplicate. Receptacle naked. Corolla of the disk 5-toothed, regular. Branches of the style semicylindrical, short. Achenia crowned with a very short scarious minutely about 5-toothed and somewhat lacerate pappus.—A very small annual herb, with the habit of Pectis, nearly glabrous, branching from the base. Leaves opposite, narrowly linear, punctate with large pellucid glands, somewhat connate at the base, near which the margins are fringed with a few bristles. Heads on short peduncles terminating the branches. Flowers yellow; those of the ray 7–8.

P. angustifolia (DC. l. c.)—Pectis angustifolia, *Torr. ! in ann. lyc. New York*, 2. *p.* 214.

On the Rocky Mountains, in about lat. 41°, *Dr. James !*—Peduncles much shorter than the leaves.

6. PECTIS. *Linn.* (excl. spec.); *Less. in Linnæa*, 6. *p.* 708, & *syn. p.* 153. *DC. prodr.* 5. *p.* 98.

Heads several-flowered; the flowers of the ray in a single series, ligulate, pistillate; those of the disk perfect, bilabiate. Involucre somewhat cylindrical; the scales 5–8, in a single series, often involute or conduplicate. Receptacle naked. Corolla of the disk bilabiate, (the two inner sinuses deeper than the others); those of the ray ligulate, the ligule longer than the tube. Branches of the style semicylindrical, short. Achenia striate. Pappus of the disk and ray similar, in a single series, chaffy, mostly pointed with serrulate (often unequal) bristles.—Mostly annual (tropical American) herbs. Leaves opposite, connate at the base, 1-nerved, punctate with pellucid glands; the margin somewhat cartilaginous, and fringed with scattered bristles. Heads on slender pedicels, or often sessile. Flowers yellow.

1. *P. linifolia* (Linn.): stem diffusely branched; leaves linear, mucronate, dotted with large glands, ciliate with bristles towards the base; heads on slender minutely bracteolate pedicels, 4–18-flowered; scales of the involucre 4–6, elliptical-lanceolate, equal, conduplicate, with broad scarious margins, not glandular; pappus of rather broad chaff, mostly awned, the bristles in the ray-flowers 2, equal, in the disk usually 5.—*Linn. amœn. acad.* 5. *p.* 107, & *spec. ed.* 2. *p.* 1250; *Lam. ill. t.* 684; *Less. l. c.*; *DC. prodr.* 5. *p.* 99.

Key West, *Mr. Bennett! Mr. Blodgett!*—A native of Jamaica, St. Thomas, &c.

TRIBE II. EUPATORIACEÆ. *Less.*

Heads discoid, with the flowers all tubular and perfect (homogamous), or sometimes heterogamous; the ray-flowers either tubular or ligulate. Style cylindrical above; the branches usually much elongated, obtuse or clavate, puberulent or papillose externally towards the summit; the stigmatic lines inconspicuous, terminating near the middle of the branches of the style, not confluent at their termination. Anthers never caudate.—Flowers mostly of the cyanic series (white, blue, or purple). Leaves commonly opposite.

CONSPECTUS OF THE GENERA.

64 Subtribe 1. EUPATORIEÆ.—Heads discoid, homogamous.

Div. 1. AGERATEÆ.—Pappus chaffy, aristate-squamellate, or coroniform.

7. CŒLESTINA. Pappus coroniform or cup-like.
8. AGERATUM. Pappus of 5–10 distinct often aristate chaffy scales.
9. SCLEROLEPIS. Pappus of 5 obtuse corneous scales. Leaves verticillate.

65 *Div.* 2. ADENOSTYLEÆ.—Pappus of slender or capillary bristles.

* *Achenia striate or ribbed.*

10. CARPHEPHORUS. Receptacle chaffy. Pappus barbellate.
11. LIATRIS. Receptacle naked. Scales of the involucre not striate. Lobes of the corolla elongated.
12. CLAVIGERA. Receptacle naked. Scales of the involucre deeply striate. Teeth of the corolla very short. Pappus plumose-barbellate.
13. KUHNIA. Receptacle naked. Teeth of the corolla short. Pappus plumose.
14. BULBOSTYLIS. Receptacle naked. Pappus scabrous. Heads 10–25-flowered.
15. BRICKELLIA. Receptacle naked. Pappus scabrous. Heads 30–50-flowered.

* * *Achenia 5-angled, not striate. Pappus scabrous.*

16. EUPATORIUM. Receptacle naked, flat. Scales of the involucre numerous.
17. MIKANIA. Receptacle naked, flat. Scales of the involucre (and flowers) 4–5.
18. CONOCLINIUM. Receptacle conical, naked.

Subtribe 2. TUSSILAGINEÆ.—Heads with the flowers heterogamous, or diœcious.

19. NARDOSMIA. Heads corymbose, many-flowered, somewhat diœcious.
20. TUSSILAGO. Head solitary, many-flowered, heterogamous; the pistillate flowers ligulate, in several series.
21. ADENOCAULON. Heads few-flowered, heterogamous; the flowers all tubular.

Subtribe 1. Eupatoriæ, *DC.*—Heads discoid; the flowers all perfect and similar, usually white, rose-color, or purple (rarely ochroleucous), never yellow.

Div. 1. Ageratæ, *Less.*—Pappus composed of chaffy often unequal scales, sometimes aristate or coroniform.

7. CŒLESTINA. *Cass. dict. 6. suppl. p. 8, & 26. p. 227; Less. syn. p. 155; DC. prodr. 5. p. 107.*

Heads many-flowered. Involucre cylindrical-hemispherical; the scales numerous, narrow, somewhat imbricated. Receptacle convex, chaffy or naked. Achenia glabrous, 5-angled. Pappus coroniform or cup-like, slightly toothed, or sometimes produced into one or two longer teeth or chaffy scales.—Annual (tropical American) branching herbs, with terete stems, and opposite petioled and toothed leaves. Heads in rather dense corymbs, pedicellate. Flowers blue or purple.

§. *Receptacle naked.*—Ageratoides, *DC.*

1. *C. maritima*: stem decumbent, branching, nearly glabrous; leaves smooth and glabrous, slightly fleshy, ovate or oval, serrate, tapering into a slender petiole; tube of the corolla sparsely pubescent with jointed hairs; pappus minute and coroniform, often with one or two slightly produced teeth, sometimes obsolete.

Key West, Florida, *Mr. Bennett! Mr. Blodgett!*—Leaves scarcely an inch long. Flowers blue.—We have seen specimens of a very similar plant from Cuba; which however has a pappus of 5 distinct mostly aristate chaffy scales, and is therefore an Ageratum: it agrees with the description of Kunth's A.? maritimum, (from the same locality) as to the foliage, &c., but not as to the corolla and pappus.—Surely Cœlestina (at least the section Ageratoides) and Ageratum are not sufficiently distinct.

8. AGERATUM. *Linn.; Gærtn. fr. t. 165; DC. prodr. 5. p. 108.*

Heads many-flowered, subglobose. Scales of the involucre numerous, imbricated, linear, acuminate. Receptacle naked. Corolla tubular, dilated above, 5-lobed. Branches of the style exserted, cylindraceous, rather obtuse. Achenia 5-angled, narrowed at the base, with a rather large callus. Pappus of 5–10 distinct chaffy scales, either aristate-acuminate, or obtuse and pectinate.—Mostly annual (tropical) herbs, with opposite petioled and toothed leaves, and corymbose heads. Flowers blue or white.

1. *A. conyzoides* (Linn.): stem branching; leaves ovate, rhomboid, or cordate, on rather long petioles; pappus of 5 somewhat serrate chaffy scales, dilated at the base, acuminate-aristate; the subulate awns as long as the corolla (flowers blue or white).—*Linn. spec. 2. p. 839; Swartz, obs. p. 301; Schkuhr, handb. t. 238; Hook. exot. fl. t. 15; DC. prodr. 5. p. 108.*

Wet places near Savannah, Georgia, *Mr. Curtis!* April–June.—Found in almost every country within or near the tropics, varying greatly in the form of the leaves; the stem and petioles also sometimes hispid, but occasion-

ally almost glabrous. In this country it has only been detected by Mr. Curtis, whose specimens seem to accord with the variety Mexicanum (A. Mexicanum, *Bot. mag. t.* 2524), except that the flowers are white.

9. SCLEROLEPIS. *Cass. dict.* 25. *p.* 365, *&c.*; *Less. syn. p.* 136.

Head many-flowered. Scales of the involucre linear, equal, in a double series. Receptacle naked. Corolla tubular-infundibuliform, 5-toothed, glabrous. Branches of the style much exserted, somewhat clavate. Achenia 5-angular. Pappus of 5 almost horny short oval and obtuse scales, in a single series.—A glabrous perennial (aquatic) herb; with simple stems, procumbent at the base, terminated usually by a single head. Leaves verticillate (5–6 in a whorl), linear, entire, 1-nerved (resembling those of Hippuris). Flowers pale purple.

S. verticillata (Cass. l. c.)—*DC.! prodr.* 5. *p.* 114. Sparganophorus verticillatus, *Michx.! fl.* 2. *p.* 95, *t.* 42; *Nutt.! gen.* 2. *p.* 139; *Ell. sk.* 2. *p.* 312. Æthulia uniflora, *Walt. Car. p.* 195.

Shallow water in pine barrens, New Jersey (at Quaker Bridge!) to Florida! July–Sept.—Stem 1–2 feet high, very leafy, a little pubescent at the summit, as also the involucre.—We have a form from Florida, with very slender stems, only about 6 inches high, and the involucre nearly glabrous.

Div. 2. ADENOSTYLEÆ, *DC.*—Pappus composed of slender hair-like bristles, either scabrous or plumose, in one or more series.

10. CARPHEPHORUS. *Cass. in bull. philom.* 1816, *& dict. sci. nat.* 7. *p.* 149; *DC. prodr.* 5. *p.* 132. (excl. spec. no. 2?)

Species of Liatris, *Michx., Nutt., DC.*

Heads many- (about 20-) flowered. Scales of the involucre imbricated in 3–5 series, ovate or lanceolate, appressed. Receptacle chaffy; the scales (subtending the flowers) lanceolate or linear, rigid, 3-nerved, mostly shorter than the flowers, deciduous with the fruit. Corolla more or less dilated above; the lobes ovate or lanceolate, mostly short. Anthers usually included. Branches of the style exserted, cylindraceous, obtuse. Achenia terete or somewhat angled, narrowed towards the base, 10-ribbed. Pappus of numerous (30–40) barbellate (rarely minutely plumose) unequal bristles, somewhat in a double or triple series.—Perennial herbs (mostly North American), with the habit of Liatris, from which the chaffy receptacle chiefly distinguishes it. Root, or caudex, thickened, but not tuberous. Stem simple, or corymbose at the summit, leafy. Leaves impressed-punctate, rigid, entire (or toothed?); the cauline ones commonly appressed. Heads corymbose-cymose, rarely racemose. Flowers purple.

This genus was established by Cassini on a specimen preserved in the herbarium of Jussieu, with no label or any indication of its native country, whence it has not subsequently been recognized. De Candolle having added a second species, founded

on the description of Liatris Baicalensis of Adams, which is said to have a chaffy receptacle, the genus has been thought to be Siberian; although a third, and doubtless genuine species from Mexico, and subsequently a fourth from Brazil, are also given by De Candolle. Cassini's original species is without doubt the Liatris squamosa of Nuttall; in which the chaffy receptacle (first pointed out to us by Dr. Chapman) had escaped the notice both of Nuttall and Hooker. On examining the allied species of Liatris, we find that all those with many-flowered heads disposed in corymbose cymes also belong to the genus; which is well marked in habit.

* *Leaves linear-subulate, appressed: heads cymose or racemose.*

1. *C. Pseudo-Liatris* (Cass. l. c.): stem virgate, simple, tomentose-pubescent; leaves linear-subulate, carinate, rigid, closely sessile, nearly glabrous, sparsely punctate; the radical ones elongated; the cauline short, very numerous, closely appressed; the uppermost pubescent; heads few (3–7), in a simple contracted cyme; the branches imbricated with very short subulate leaves; scales of the involucre ovate-lanceolate, rigid, appressed, tomentose-pubescent; achenia minutely hairy; pappus barbellate.—Liatris squamosa, *Nutt.! in jour. acad. Philad. 7. p.* 73; *Hook.! compan. to bot. mag.* 1. *p.* 95.

β. heads (13–14) racemose. *Hook. l. c.*

Dry soil, Alabama, *Dr. Gates!* Middle Florida, *Dr. Chapman!* Also Covington and Jacksonville, Louisiana, *Drummond* (with var. β.), & Pascagoula, Mississippi, *Dr. Riddell!*—Stem about 2 feet high, very straight; the whole plant of a pale gravish hue. Radical and lower leaves 4–5 inches long; the cauline ones diminishing in size upwards, those at the summit and on the peduncles less than half an inch in length, strongly appressed. Flowers 20 or more in each head, (instead of 6–8 as described by Nuttall), bright purple. Scales of the involucre imbricated in about 3 series. Chaff of the receptacle lanceolate, resembling the inner scales of the involucre, rigid, colored and often hairy at the summit, nearly as long as the flowers.—We have not seen the var. β.

* * *Leaves plane, lanceolate, spatulate, or oblong: heads corymbose-cymose.*

2. *C. tomentosus:* stem tomentose-puberulent above, corymbose at the summit; leaves punctate, mostly nearly glabrous, acute; the radical ones lanceolate or lanceolate-spatulate, tapering into a petiole, somewhat 3-nerved; the cauline small, scattered, lanceolate or ovate, sessile, slightly appressed; the uppermost pubescent; heads 1–5 on each branch of the loose and spreading corymbose cyme; scales of the somewhat cylindrical-campanulate involucre ovate or ovate-lanceolate, acute, appressed, or with slightly spreading tips, very tomentose and glandular; lobes of the corolla ovate-lanceolate; pappus rather strongly barbellate.—Liatris tomentosa, *Michx.! fl.* 2. *p.* 93; *Pursh, fl.* 2. *p.* 510; *Curtis! pl. Wilmingt., in Boston, jour. nat. hist.* 1. *p.* 127; not of *Ell.* L. Walteri, *Ell.! sk.* 2. *p.* 285; *DC. l. c.* Anonymos uniflora, *Walt. Car. p.* 198.

Margin of swamps, Virginia (*Pursh*) and North Carolina, *Michaux! Mr. Croom! Mr. Curtis!* to Georgia, *Dr. MacBride!* (*Elliott.*) Sept.–Oct.—Stem about 2 feet high. Cyme sometimes simple with 5 or more heads, but often corymbose with the branches elongated and much spreading. Scales of the involucre imbricated in 4 or 5 series, hoary but often somewhat colored, without scarious margins. Corolla deep purple. Pappus purplish. Chaff of the receptacle (often wanting in the centre of the head) narrowly linear, a little hairy at the tip, rather shorter than the flowers.

3. *C. bellidifolius:* low, nearly glabrous; stems numerous from the same root, slender, branching above; radical leaves spatulate, 3-nerved, tapering into a petiole, punctate with scattered impressed dots; the cauline small and

scattered, mostly linear; heads commonly solitary upon each slender branch of the nearly simple corymb; scales of the involucre rather loose, oblong and obovate, very obtuse, not margined; the outermost spreading; lobes of the corolla lanceolate-linear, elongated; achenia hairy; pappus densely plumose-barbellate.—Liatris bellidifolia, *Michx.! fl.* 2. *p.* 93; *Nutt.! gen.* 2. *p.* 133; *DC. prodr.* 5. *p.* 132.

Dry sandy hills, near Wilmington, North Carolina, *Michaux! Nuttall! Delile! Mr. Curtis! &c.* Sept.—Plant 8–12 inches high; the stem often branched from about the middle. Scales of the campanulate involucre in about 3 series, glabrous, the margin scarcely scarious or ciliate; the outermost smaller and bracteolate; the second series obovate or obovate-oblong; the innermost linear-oblong and much longest. Bristles of the pappus almost plumose to the naked eye. Chaff of the receptacle narrowly linear, as long as the flowers, deciduous.

4. *C. corymbosus:* stem solitary, tall, stout, somewhat hirsute-tomentose; leaves nearly glabrous, about 1-nerved; the radical ones oblanceolate, obtuse, gradually tapering to the base; the cauline small and numerous, oblong, closely sessile; heads about 20, in a dense terminal corymbose cyme; the branches short, tomentose-hirsute, scales of the involucre nearly glabrous, appressed, oval, very obtuse, with a broad scarious and somewhat fringed margin; lobes of the corolla ovate, very short; achenia slightly hairy; pappus barbellate.—Liatris corymbosa, *Nutt.! gen.* 2. *p.* 132 (excl. syn.); *DC. l. c.* L. tomentosa? *Ell. sk.* 2. *p.* 284, not of *Michx.*

Damp sandy soil, and along the margin of swamps, N. Carolina! to Georgia! and Florida! Sept.–Oct.—Stem 2–4 feet high, striate. Leaves somewhat fleshy, 1-nerved or very slightly tripli-nerved, sometimes obscurely punctate; the radical ones 4–6 inches long, very gradually narrowed to the base; the cauline (gradually diminished to about half an inch in length,) appressed. Inner scales of the involucre scarcely longer than the others. Corolla pale purple. Pappus mostly white. Chaff of the receptacle linear or lanceolate, with scarious tips, shorter than the flowers; often wanting in the centre of the head.

11. LIATRIS. *Schreb. gen. p.* 542; *DC. prodr.* 5. *p.* 128. (excl. spec.)

Heads few–many-flowered. Scales of the involucre few or numerous, imbricated, not striate. Receptacle naked. Corolla tubular, 5-lobed, the lobes usually elongated. Branches of the style much exserted, cylindraceous or somewhat flattened, obtuse. Achenia nearly terete, tapering to the base, about 10-ribbed. Pappus of numerous (15–40) plumose or barbellate bristles.—Perennial (North American) herbs or very rarely shrubby plants, mostly with simple stems and a tuberous root. Leaves alternate or scattered, usually lanceolate or linear and entire, with a rigid or cartilaginous margin, 1–5-nerved, rarely veiny. Heads disposed in an elongated spike or raceme (flowering from the summit downwards), sometimes (as if by accident) paniculate, rarely corymbose. Flowers purple, occasionally varying to white; the corolla, style, &c. commonly dotted with scattered resinous globules.

§ 1. *Root a globose mostly naked tuber (impregnated with a terebinthine substance): leaves linear or lanceolate, gramineous, 1–5-nerved, mostly punctate with impressed and resinous dots: heads in a virgate spike or raceme: involucre manifestly imbricate: lobes of the corolla lanceolate or linear:*

pappus evidently plumose, or minutely and densely plumose-barbellate. —EULIATRIS. (Euliatris & Suprago, *DC.*)

* *Inner scales of the* (4–5-*flowered*) *involucre longer than the corolla, produced into a dilated and ligulate colored appendage: pappus very plumose.* (Calostelma, *Don.*)

1. *L. elegans* (Willd.): stem and involucre villous-pubescent; leaves glabrous, punctate; the radical ones spatulate or oblanceolate, 3–5-nerved; the upper cauline ones linear, short, spreading or reflexed, often mucronate; spike or raceme virgate, dense; the pedicels bracteolate, often very short; scales of the involucre 10–12, glandular; the appendages of the inner ones ovate or lanceolate (bright purple or sometimes white), spreading: achenia villous.—*Willd.! spec.* 3. *p.* 1635; *Michx.! fl.* 2. *p.* 91; *Bot. reg. t.* 267; *Nutt.! gen.* 2. *p.* 132; *Ell. sk.* 2. *p.* 279; *DC.! prodr.* 5. *p.* 129. Stæhelina elegans, *Walt.! Car. p.* 202. Serratula speciosa, *Ait.! Kew.* (*ed.* 1) 3. *p.* 138. Eupatorium speciosum, *Vent. hort. Cels. t.* 79.

β. raceme compound (doubtless an accidental or occasional state).

Dry barren soil, Virginia to Florida! Louisiana! and Texas! Aug.–Sept.—Stem 3–5 feet high, strict. Spike or raceme compact, a foot or more in length. Bristles of the pappus about 18, in a single series.

* * *Scales of the involucre very numerous and imbricated in several series, without petaloid appendages: heads* (*few*) *cylindrical or slightly clavate, many-* (20–60-) *flowered: lobes of the corolla hirsute within; pappus very plumose.*

2. *L. squarrosa* (Willd.): pubescent or hairy, or nearly glabrous, very leafy; leaves linear, elongated, rigid, scarcely punctate; the lower ones 3–5-nerved; the radical very long; heads few (sometimes solitary), sessile or on short pedicels, many-flowered; scales rigid, ciliate, not punctate, with more or less elongated and pointed foliaceous spreading extremities; the inner ones mucronate-acuminate; the outermost often bracteolate and resembling the upper leaves; achenia minutely pubescent.—*Willd.! l. c.; Michx.! fl.* 2. *p.* 92; *Ell.! sk.* 2. *p.* 282; *Hook. fl. Bor.-Am.* 1. *p.* 306; *DC.! prodr.* 5. *p.* 129. Cirsium tuberosum &c., *Dill. Elth. t.* 71, *f.* 82. Serratula squarrosa, *Linn.! spec.* 2. *p.* 818. Pteronia Caroliniana, *Walt.! Car. p.* 292.

β. floribunda: heads numerous (20 or more), in a somewhat paniculate or branched raceme; the pedicels, or rather branches, elongated and leafy.

γ. compacta: glabrous; leaves crowded, very narrow; heads several, closely sessile, approximate; scales of the involucre lanceolate, with long mucronate points, all erect; the exterior linear and resembling the uppermost leaves.

δ. intermedia (DC.): mostly hairy; heads (1–5) turbinate-cylindrical, pedicellate; exterior scales of the involucre elongated and foliaceous, erect; the interior acute, scarcely or not at all squarrose.—L. intermedia, *Lindl. bot. reg. t.* 948.

Dry barren or sandy soil, Upper Canada! to Florida! and Texas! (*γ.* Arkansas, *Dr. Leavenworth!*) July–Sept.—Stem 1–3 feet high, often nearly glabrous, sometimes almost hirsute, as well as the leaves and involucre. Heads about an inch long; the points of the upper scales often purplish. Flowers bright purple. Bristles of the pappus 18–20, often purplish.—The var. *γ.* is the most remarkable form; but in the ordinary plant the scales are sometimes erect. Through the not uncommon var. *δ.* this species seems almost to pass into L. cylindracea, which however it is perhaps safer to consider distinct.—*Blazing Star. Button Snake-root. Rattle-snake's-master.* (One of the popular antidotes for the bite of the Rattle-snake.)

3. *L. cylindracea* (Michx.): glabrous or slightly hairy; stems low, leafy; leaves linear, rigid, scarcely punctate, mostly 1-nerved; heads (1–7, rarely 12) turbinate-cylindrical, sessile or pedicellate, 16–20-flowered; the scales of the involucre all short and appressed, with rounded or obtuse abruptly mucronulate tips, often ciliate, not punctate; achenia pubescent.—*Michx.! fl.* 2. *p.* 93; *Ell.! sk.* 2. *p.* 275; *DC. l. c.*; not of *Pursh.* L. stricta, *MacNab! in Edinb. phil. jour.* 19, *p.* 60.

Dry woods and prairies, Michigan! (and N. W. Territory, *Dr. Houghton!*) Upper Canada! Illinois! Missouri! &c., apparently nearly confined to the Western States. July–Sept.—Stem 6–18 inches high. Heads about an inch long; the exterior scales of the involucre commonly very short, rarely somewhat prolonged or foliaceous. Flowers bright purple.

* * * *Scales of the* (5–30-*flowered*) *involucre without petaloid appendages: lobes of the corolla glabrous within.*

† Pappus evidently plumose to the naked eye: heads 3–6-flowered.

4. *L. punctata* (Hook.): stems several from the same tuberous-fusiform root, stout, nearly glabrous, very leafy; leaves linear, rigid, manifestly punctate on both surfaces with impressed dots, glabrous, the margins often remotely ciliate with bristly hairs; heads in a dense spike (which is often leafy towards the base), 4–6-flowered; scales of the cylindraceous involucre oblong, conspicuously punctate, imbricated, appressed, with more or less spreading mucronate-acuminate tips; the margins lanuginous-ciliate; achenia hairy; pappus very plumose.—*Hook.! fl. Bor.-Am.* 1. *p.* 306, *t.* 55; *DC. l. c.* L. cylindrica, *Torr.! in ann. lyc. New York*, 2. *p.* 210. L. resinosa, *DC.! prodr.* 5. *p.* 129 (pl. Arkans.), not of *Nutt.*

β. leaves nearly all very narrowly linear; the margins remotely ciliate or naked; scales of the involucre narrower, tapering somewhat gradually into a cuspidate-acuminate point, at least the inner ones; spike usually short; stem often slender.

γ. leaves conspicuously ciliate with hispid hairs; inner scales of the involucre purplish above.

Arid plains and prairies, Saskatchawan, *Drummond*, *Douglas!* and throughout the country between the Upper Mississippi and the Missouri, *Mr. Nicollet!** to Arkansas, *Dr. James! Dr. Pitcher! Dr. Leavenworth!* and Texas, *Drummond!* Aug.–Sept.—Stems 8 inches to 2 or 3 feet high, usually several from the thick and somewhat knotted often fusiform root, leafy to the summit. Lower leaves 3–5 inches long, slightly 3-nerved; the others 1-nerved, varying from 3 lines to less than a line in width, pungently acute. Spike 3–4 to 10 inches long. Flowers reddish-purple. Bristles of the pappus about 30, purplish or nearly white. Achenia almost villous when young, 3–4 lines long.—A well-marked species; the varieties we have indicated passing into each other. Some of the specimens of the collection made in Mr Nicollet's expedition (our var. *γ.*), have the margin of the leaves conspicuously fringed with rigid jointed hairs: others are very sparsely ciliate,

* We are greatly indebted to the kindness of Mr. Nicollet, for an extensive collection of dried specimens, made during his survey of the country between the Upper Missouri and the sources of the Mississippi, under the orders of the Secretary of War. The collection was formed by Mr. Charles A. Geyer, an assiduous German botanist who was attached to the expedition. The specimens are very complete, and in the finest preservation; and the localities, with other particulars, have been carefully recorded by Mr. Geyer: they were chiefly gathered during the autumn and latter part of summer; their earlier, and perhaps most interesting collections were unfortunately lost.

with the leaves and involucral scales narrower, nearly like one of the forms from Texas.

5. *L. mucronata* (DC.): glabrous; stem slender, very leafy; leaves narrowly linear, very acute, minutely punctate; the lowermost elongated, the uppermost short, almost setaceous or subulate; spike long and narrow, dense; the heads (small) sessile, or on appressed pedicels shorter than the subulate bracts, 3–5-flowered; scales of the narrow and somewhat cylindrical involucre few, (purplish, the margins not scarious,) appressed, shorter than the pappus, ovate-lanceolate, mucronate, slightly ciliate; the exterior shorter; pappus manifestly plumose.—*DC. prodr.* 5. *p.* 129.

Texas, "in the eastern districts, *Berlandier*," *Drummond!* Western Louisiana, *Dr. Hale!*—Stem 2–4 feet high, virgate; the slender spike sometimes 2 feet long. Lower leaves about 2 lines wide; the upper crowded, 2–3 inches, and gradually diminishing to less than an inch in length, and less than half a line in width, flat. Heads 4–5 lines long; the lowermost shorter, the uppermost much longer than the bracts. Corolla bright purple. Pappus longer than the achenium, of about 30 often purplish bristles, manifestly plumose to the naked eye, but less so than in L. punctata.—Varies with the achenia minutely pubescent throughout, or on the ribs alone, or perfectly glabrous; and with the scales of the involucre either abruptly cuspidate-mucronate, or gradually narrowed into a subulate-mucronate point; the latter being more common in the specimens we have examined. The plant of De Candolle (which we have not compared with our own) is said to have pubescent achenia, and the obtuse scales abruptly mucronate: it may be different from the plant we have described, and possibly what we consider a narrow-leaved variety of L. punctata; but that species would not be compared with L. tenuifolia, and besides is well characterized by De Candolle, under the name of L. resinosa.

6. *L. Boykinii:* nearly glabrous; stem slender, erect; leaves linear, punctate; the lower elongated, the upper short and setaceous; spike virgate; the heads rather crowded, subsessile, or on appressed pedicels much shorter than the subulate bracts, 3–4-flowered; scales of the involucre (about 8) glabrous, scarcely punctate; the outer ones short, lanceolate-subulate; the interior lanceolate or linear, with scarious margins and acuminate spreading summits, equalling or exceeding the pappus; achenia villous; pappus manifestly plumose.

Near Columbus, Georgia, *Dr. Boykin!* Aug.–Sept.—Stem 1–2 feet high. Leaves rather scattered. Spike 6–10 inches long. Heads half an inch in length, exceeding the bracts, on very short pedicels if any. Inner scales of the involucre membranaceous, with scarious and slightly colored margins and tips. Flowers apparently pale purple. Pappus plumose to the same degree as the preceding, more so than any of the following species. Heads larger than L. mucronata, or especially L. tenuifolia, rather smaller than those of L. secunda.

7. *L. tenuifolia* (Nutt.): glabrous; stem very slender; radical and lower leaves crowded, very narrowly linear or almost filiform, elongated, often hairy towards the base, punctate; the upper ones very short, setaceous, scattered; raceme virgate; heads (small) 5-flowered, crowded; the pedicels mostly bracteolate and longer than the setaceous bracts, sometimes branching; scales of the involucre (about 10) erect, glabrous, not punctate, usually mucronulate; the outermost ovate-lanceolate, very short; the inner oblong, obtuse, with membranaceous (purplish) margins, rather shorter than the pappus; achenia villous; pappus barbellate-plumose.—*Nutt.! gen.* 2. *p.* 131; *Ell.! sk.* 2. *p.* 275; *DC. prodr.* 5. *p.* 128.

β. radical leaves broader, coriaceous.—L. lævigata, *Nutt! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 285.

Dry pine barrens, N. Carolina to Georgia! and Florida! Aug.–Oct.—Stem 2–4 feet high. Radical leaves resembling those of Pinus palustris. as remarked by Nuttall (a few of the exterior sometimes 2 lines broad), rigid, forming a close tuft in the manner of Xerophyllum. Raceme elongated; the pedicels 8–12 lines long. Flowers purple. Achenia turbinate. Pappus scarcely plumose to the naked eye; the bristles 20–25.—Like most species of this section, the pedicels are sometimes elongated and branched, forming a paniculate inflorescence. Heads usually quite small.

† † Pappus densely barbellate: heads 3–40-flowered.

8. *L. secunda* (Ell.): minutely pubescent or glabrous; stem slender, decurved; leaves linear, short, rather obtuse, the upper ones bract-like; raceme virgate; the heads all turned to one side, on short mostly recurved and bracteolate pedicels, 4–5-flowered; involucre cylindrical; scales 12–14, with slightly scarious margins, often resinous-punctate; the exterior oval and very short; the interior as long as the pappus, oblong-lanceolate, mucronate-acuminate; achenia villous; pappus minutely and densely plumose-barbellate. —*Ell.! sk.* 2. *p.* 278; *DC.! prodr.* 5. *p.* 131.

Dry sandy soil, S. Carolina! to Florida! Aug.–Sept.—Stem 1–3 feet high. Raceme 6–12 inches long, curved, rarely slightly compound, beautifully unilateral. Heads 6–8 lines long; the scales appressed, mostly 1-nerved. Bracts and bracteoles subulate, very short. Flowers light purple.

9. *L. gracilis* (Pursh): somewhat cinereous-pubescent or nearly glabrous; stem slender, simple, bearing numerous heads in a long virgate raceme, sometimes compound or paniculate; leaves linear or lanceolate-linear, short, 1-nerved, often sparsely pilose-ciliate towards the base; the lower ones lanceolate, obtuse; heads (small) on divaricate pedicels, few-flowered; scales of the somewhat cylindraceous involucre few, oblong or elliptical, obtuse, resinous-punctate, appressed, shorter than the barbellate pappus; achenia turbinate, villous.

α. nearly glabrous; raceme elongated, simple, or slightly compound at the base; heads (5–7-flowered) on elongated divaricate, or even reflexed, simple pedicels.—L. gracilis, *Pursh, fl.* 2. *p.* 508.

β. heads 3–5-flowered, in a slender virgate raceme, on filiform more or less elongated divaricate (or somewhat reflexed) pedicels; of which the lower are furnished with scattered bracteoles similar to the exterior scales of the involucre, and rarely bearing one or two subsessile lateral heads; scales of the cylindraceous involucre pubescent and ciliate; the outermost very short, often slightly acute.—L. paucifloscula, *Nutt.! in jour. acad. Philad.* 7. *p.* 71.

γ. raceme virgate, simple, or frequently branched or paniculate below; heads (3–5-flowered) on short divaricate pedicels, or sometimes almost sessile; otherwise as in *β.*

δ. inflorescence entirely paniculate; the branches simple, ascending; a few of the uppermost only bearing single heads, short; the lower successively elongated, slender, bearing few or several racemose (3–5-flowered) heads, on short pedicels, or sometimes almost sessile; otherwise as in *β.* and *γ.*

Pine barrens, Georgia! Alabama! and Florida! *γ.* Alabama, *Mr. Buckley!* Aug.–Oct.—Stem 1–3 feet high, usually clothed with a minute somewhat cinereous pubescence. Leaves rather thick, spreading, minutely punctate, often obtuse, tapering to the base; the upper 1–2, the lower 3–5 inches in length, sometimes hairy. Raceme, when simple, 4–15 inches long; with the pedicels 1½ to 2 inches long in Pursh's plant (*herb. Banks.*), nearly an inch long (about the length of the bracteal leaves) in our var. *β.*, shorter, but very variable in the other forms. Heads smaller than in any other species of this section, except L. tenuifolia; the scales of the involucre 7–9, mostly pubescent and ciliate. Flowers bright purple.—The plants

here arranged (*β*. *γ*. & *δ*.) are undoubtedly different forms or states of one and the same well-marked species, differing in no respect except the developement of the inflorescence, which affords most fallacious characters in this genus. There is an obvious tendency to branch in the inflorescence of all the racemose species, which is manifest, not only when the summit of the stem receives an injury, but in most very vigorous individuals; an almost necessary result of the successive developement of the heads from the apex of the stem or branch downwards, or outwards, (in which the plants with a racemiform disposition of the heads do not differ from other Compositæ,) which effectually preventing farther growth from the summit, the powers of the plant are directed to the production of additional heads, either from the axils of the upper cauline leaves, or of the bracts with which the pedicels (peduncles), especially the lower ones, are usually furnished. This is particularly exemplified in the present species; which exhibits almost every gradation between the simple racemiform inflorescence, and a kind of panicle which results from the developement throughout of lateral heads on the otherwise simple branches.—We regret that we have not been able to settle the synonymy of several species in this difficult genus. Mr. Bennett, who has most obligingly compared fragments from our specimens of this and other allied species with those preserved in the Banksian herbarium, considers our var. *β*. as probably identical with the Liatris gracilis of Pursh; the differences consisting chiefly in the degree of pubescence, and the length of the peduncles or branches of the inflorescence. As the (unexpanded) heads in Pursh's specimen are globose-ovate and at least 6-flowered, we were strongly inclined to consider that plant identical with a form of the following species; but Mr. Bennett, on comparing the two, did not recognize the resemblance. If the species here described should prove distinct from L. gracilis, it will retain the appropriate name of L. paucifloseulosa, *Nutt.*

10. *L. graminifolia* (Willd. ?): glabrous or sparsely hairy; stem slender; leaves linear, somewhat scattered, 1-nerved. usually ciliate towards the base with scattered hispid hairs; the lowermost elongated; heads 7–9- (rarely 10–14-) flowered, spicate or racemose, sometimes partly paniculate; involucre obovoid-turbinate or broadly obconical, acute at the base; the scales (12–20) regularly imbricated in several series, appressed, spatulate or oblong, very obtuse, sometimes slightly mucronulate, mostly resinous-punctate and with slight scarious margins; the exterior very short, roundish-oval or obovate; achenia villous-pubescent; pappus densely barbellate.—Anonymos graminifolius & ramosus, *Walt. Car. p.* 197 ?

α. heads rather small, 7–9-flowered, mostly sessile and rather remote, forming a slender spike; lower bracts longer, the uppermost shorter than the heads.—L. graminifolia, (*Pursh, fl.* 2. *p.* 508 ?) *Nutt.! gen.* 2. *p.* 131; *Ell.! sk.* 2. *p.* 274; *DC.! prodr.* 5. *p.* 130, (excl. pl. cult., which belongs to L. spicata!)

β. heads larger, 7–14-flowered. (Varies, 1. with the heads few or numerous, somewhat scattered, sessile or nearly so: 2. heads few or numerous, in a simple raceme; the pedicels sometimes shorter, sometimes much longer than the heads, erect-spreading or slightly recurved: 3. heads numerous, approximate, sessile; the inflorescence branched below, the heads on the short simple branches also sessile.)—Serratula foliis linearibus, floribus solitariis sessilibus, *Gronov.! fl. Virg. ed.* 1. *p.* 92.

γ. heads small, 6–12-flowered, on spreading or often recurved pedicels, forming a long virgate raceme, sometimes compound or paniculate at the base.—L. gracilis, *Ell. l. c.*, not of *Pursh ?* L. pilosa *β*. gracilis, *Nutt. l. c.* L. virgata, *Nutt.! in jour. acad. Philad.* 7. *p.* 72, & *in trans. Amer. Phil. soc.* (*n. ser.*) 7. *p.* 284 (inflorescence compound).

δ. ? heads rather larger, 7–12-flowered, spicate, or racemose, with the pedicels short and erect, or sometimes with the inflorescence compound

below; scales of the involucre somewhat narrower and less rounded at the summit, usually ciliate.—L. pilosa, *Pursh, l. c.* (chiefly); *Nutt. l. c.; Ell.! sk.* 2. *p.* 277, "var. dubia" (the inflorescence compound below); *Lindl. bot. reg. t.* 595 ("*β.* gracilis"); *Lodd. bot. cat. t.* 356; not of *Willd.* (*Ait.*) L. pilosa *β.* lævicaulis, *DC.! prodr.* 5. *p.* 131. L. spicata *γ.* racemosa, *DC.! l. c. p.* 130. L. dubia, *Bart. veg. mat. med.* 2. *p.* 222, *t.* 49. "L. turbinata, *Sweet, in Loud. hort. Brit.*" Anonymos ciliatus, *Walt. Car. p.* 197*?*

Pine barrens, often in wet places, New Jersey! (var. *δ.*?) to Alabama! and Florida! common. Aug.–Oct.—Stem 1–4 feet high. Heads as large or larger than in L. spicata, in var. *a.* & *γ.* smaller.—Our chief doubts respecting the plants here brought together, relate to var. *δ.*?, which is very properly called L. dubia by Barton, and which varies between this species and L. spicata, while it presents no characters that we can seize upon to distinguish it as a separate species. The chief distinctions between this species and L. spicata consist in the usually larger, fewer, and more scattered heads; the more regularly imbricated scales of the obconical or obovate involucre, diminishing successively to the outermost, which are very short; the more hairy and shorter achenia, &c. We are by no means certain that we have correctly referred this species to the L. graminifolia of Willdenow, which appears to have been derived from Muhlenberg; in whose herbarium several species are mingled under this name. Our remarks upon the inflorescence of the preceding, apply equally to the present species; and it may also be remarked, that the heads of the compound portion of the inflorescence are frequently smaller and fewer-flowered than the others. We have an interesting variety, or state, sent from Middle Florida by Dr. Chapman; a plant at least six feet high, the inflorescence of which exceeds three feet in length, consisting of a dense virgate raceme (more than 2 feet long) of crowded heads, on spreading or recurved pedicels not larger than the heads themselves, which at the apex are as large as is usual in this species, but very gradually diminish in size towards the base: below the inflorescence is compound, consisting of numerous filiform branches, 2–4 inches long; bearing several mostly sessile heads, which are seldom more than half the size of those at the summit of the raceme.—In a single cultivated specimen of the paniculate state of this species, Mr. Nuttall (*Trans. Amer. phil. soc. l. c.*) remarked chaffy scales intermixed among the flowers. This accidental occurrence, however, will hardly be thought to overthrow a genus so well marked by habit as Carphephorus proves to be.

11. *L. spicata* (Willd.): glabrous, or rarely pubescent; stem strict, very leafy; leaves linear, acute; often ciliate towards the base; the upper ones very short, often subulate; the lowermost elongated, 3–5-nerved; heads about 8- (sometimes 10–13-) flowered, sessile, aggregated in a dense elongated spike; involucre cylindrical or cylindrical-campanulate, obtuse at the base; the scales (15–20) appressed, resinous-punctate and with narrow scarious (purplish) margins, obtuse; the inner oblong; the exterior oval or roundish, short; achenia more or less hairy or pubescent, or almost glabrous when mature; pappus densely barbellate.—*Willd.! spec.* 3. *p.* 1636; *Bot. mag. t.* 1411; *Ell. sk.* 2. *p.* 273; *Brit. fl. gard. t.* 49; *Nutt.! gen.* 2. *p.* 131; *Darlingt.! fl. Cest. p.* 448; *DC.! prodr.* 5. *p.* 130. (*a.* & *β.*) L. macrostachya, *Michx.! fl.* 2 *p.* 91; *Pursh, l. c.* Serratula spicata, *Linn.! spec.* 2. *p.* 819 (excl. syn. *Gronov.*); *Andr. bot. rep. t.* 401. Suprago spicata, *Gærtn. fr.* 2. *p.* 402, *t.* 167. Cirsium tuberosum, &c. *Dill. Elth. t.* 72, *f.* 83.

β. heads about 5-flowered; plant smaller.—L. resinosa, *Nutt.! gen.* 2. *p.* 131, not of *DC.*

Moist ground, Michigan! and New Jersey! to Florida! and Louisiana! common. Aug.–Oct.—Stem 2–5 feet high. Leaves often hairy on the nerves, spreading or somewhat erect. Spike 5–15 inches long; the heads

sessile or nearly so, mostly crowded, about half an inch in length: lower bracts longer, the upper much shorter than the heads. Flowers bright purple. Achenia about the length of the pappus.—The number of flowers in the head is variable. (Mr. G. Watson has discovered, near Philadelphia, a state of this plant with pale pink, or sometimes pure white flowers.)—*Button-Snake-root.*

12. *L. pycnostachya:* hirsute or nearly glabrous; stem stout, strict, very leafy; leaves strict, rigid, closely sessile, and partly clasping at the base; the radical and lower ones elongated, lanceolate, obtuse, 5–7-nerved; the upper short and much crowded, narrowly linear, acute; spike elongated, thick and dense, somewhat leafy below; the heads closely sessile, about 5-flowered; involucre cylindrical; the scales (14–16) oblong or lanceolate, usually acute, with scarious and colored margins, scarcely punctate, rigid, appressed, squarrose at the summit; achenia pubescent; pappus densely barbellate.—*Michx.! fl.* 2. *p.* 91; *Pursh, fl.* 2. *p.* 507 (excl. syn. *Dill. & Walt.?*); *DC. l. c.*

α. stem densely hirsute; leaves more or less hairy; scales of the involucre strongly ciliate, often glandular.

β. stem, leaves, and involucre nearly glabrous.—L. brachystachya, *Nutt.! in jour. acad. Philad.* 7. *p.* 72.

Prairies of Illinois! Missouri! Arkansas! Louisiana! & Texas! (not extending eastward beyond the Alleghany Mountains.) Aug.-Oct.—Stem 3–5 feet high, striate, stout. Spike very dense, cylindrical, and 12–18 inches long, or often short and somewhat clavate, an inch or more in diameter when fully developed; sometimes (in starved specimens of both varieties) slender and looser. Heads equalling or exceeding those of L. spicata in length, but narrower.—A well-marked species, resembling some forms of L. spicata, but readily distinguished by its squarrose involucre. The upper leaves are usually very short, bract-like, subulate, and somewhat appressed.

13. *L. pilosa* (Willd.): more or less pubescent with long scattered hairs; stem stout; leaves linear or linear-lanceolate, elongated, hairy; heads in a loose simple raceme, 10–15-flowered; scales of the turbinate or campanulate involucre glabrous, not punctate, with slight scarious margins; the exterior narrowly oblong, short, very obtuse; the innermost linear; achenia pubescent, nearly as long as the densely barbellate (almost plumose) pappus.—*Willd. spec.* 3. *p.* 1636; scarcely of any succeeding author. Serratula pilosa, *Ait.! Kew.* (*ed.* 1) 3. *p.* 138.

"North America: introduced [into the Kew garden] 1783, by Mr. Wm. Young." *Hort. Kew. l. c.* On Seven-mile Mountain (in the Alleghanies), Virginia, *Mr. Read!* (in *herb. Acad. Philad.*)—Plant nearly as stout as L. scariosa. Heads somewhat scattered, 8–10 lines long, on pedicels which vary in length from 1–3 inches, or are sometimes shorter than the head. Interior scales of the involucre narrow, rather acute, about half an inch long. Achenia and pappus nearly equal in size to L. scariosa.—Our description is drawn from our own memoranda upon an authentic specimen in the Banksian herbarium, and from fuller notes kindly communicated by Mr. Bennett; also from a plant collected in the mountains of Virginia by Mr. Read, the only native specimen we have met with, which accords so well with the original plant as to leave no reasonable doubt of their identity. It has long since disappeared from the English gardens; and being probably a very rare or local species, the name and insufficient character of the Hortus Kewensis have been generally assigned to a very different plant. The character of Pursh's L. pilosa is not inapplicable to the true species; but the habitat he gives, the size of the heads, &c. do not accord. That of De Candolle is chiefly derived from the detailed description of Elliott, which is entirely drawn from a specimen of the New Jersey plant, as is proved by his her-

barium. The L. pilosa *β*. lævicaulis, *DC.* is identical with L. spicata *γ*. racemosa of the same author.

14. *L. scariosa* (Willd.): stem stout, more or less pubescent; leaves lanceolate, pubescent or glabrous, obscurely if at all punctate with impressed dots; the radical and lower ones usually large, oval, oblong-lanceolate, or obovate-oblong, somewhat veiny, tapering into a petiole; heads (few or numerous) racemose or spicate, subglobose, 20–40-flowered; scales of the involucre very numerous, obovate or spatulate, very obtuse, often punctate, with more or less ciliate scarious often denticulate and colored margins; the lower ones sometimes a little spreading or squarrose; the lowest bracteolate and often acute; achenia hairy or villous, about the length of the plumose-barbellate pappus.—*Willd.! spec.* 3. *p.* 1635; *Ell.! sk.* 2. *p.* 281; *Bot. mag. t.* 1709; *Bot. reg. t.* 590; *Brit. fl. gard. t.* 87; *Bigel. fl. Bost. ed.* 2. *p.* 293; *Hook.! fl. Bor.-Am.* 1. *p.* 306. L. squarrulosa, aspera, & spheroidea, *Michx.! fl.* 2. *p.* 92. L. scariosa & spheroidea, *DC.! prodr.* 5. *p.* 129 & 130. L. borealis, "*Paxton, mag.* 5. *t.* 27." L. heterophylla, *Nutt.! gen.* 2. *p.* 131, not of *R. Br.?* Serratula scariosa, *Linn.! spec.* 2. *p.* 818. Vernonia scariosa, *Poir.*

Dry, usually sandy soil, from the Saskatchawan and Upper Canada! to Florida! Louisiana! & Texas! Aug.–Oct.—Stem 1–5 feet high. Heads often an inch in diameter. Flowers bright purple, or rarely pure white!—Varies with the stem nearly glabrous, or sometimes almost tomentose at the summit; the leaves smooth and glabrous, very scabrous (L. aspera, *Michx.*), or pubescent; the heads from 3–10 or more, when they are usually somewhat distant and distinctly pedicelled (the pedicels shorter or sometimes longer than the heads,) to 30 or 50, when they usually form a dense spike. But the forms are so numerous and diversified that marked varieties cannot be characterized. It is mostly a pretty large and stout plant; but is sometimes slender, 12–18 inches high, with smaller heads, and small linear-lanceolate cauline leaves; when it is frequently called L. heterophylla.

15. *L. heterophylla* (R. Brown): leaves lanceolate, smooth and glabrous; the upper ones linear-lanceolate and much smaller; heads spicate, on very short peduncles; scales of the involucre lanceolate, squarrose, naked.—*R. Br. in Ait. Kew.* (*ed.* 2) 4. *p.* 503.

"Native of N. America: cult. 1790, by Mr. William Malcolm. *Fl.* July and August," *R. Br.* "In S. Carolina and Georgia, *Fraser, Bartram,*" *Pursh.*—To the original character of this species, we have only to add the following notes upon the specimen preserved in the Banksian herbarium, obligingly communicated by Mr. Bennett: "Heads about 10, forming a compact spike of little more than two inches in length, apparently 15–16-flowered; in size and shape they appear to resemble those of L. scariosa; but the scales are long, pointed, and more decidedly squarrose." Apparently the species has not been subsequently met with in this country; but we have often seen depauperate forms of L. scariosa with this name, yet never with pointed scales. Pursh's reference to *Willd. enum.* is a mistake, as Willdenow has no such species.

16. *L. pauciflora* (Pursh): stem simple, glabrous; leaves linear; panicle virgate, leafy; the branches short, bearing few subsessile secund 3–5-flowered heads; scales of the involucre erect, lanceolate, acute. glabrous. *Pursh, fl.* 2. *p.* 510.

In Georgia, *Bartram,* (*herb. Banks*) Flowers small, the size of No. 4. [which is L. heterophylla.] *Pursh.*—We have translated the character of Pursh, merely changing the name 'calyx' to involucre, &c. This still very obscure species evidently does not belong to the same division with L. paniculata &c., where Pursh places it; for, according to Mr. Bennett's remarks upon the specimen, "the primary branches of the inflorescence (which

is 7 or 8 inches long,) are not corymbose but simple, slender, from an inch and a half to two inches in length, suberect, and each bearing 3 to 4 subsessile secund (obconic or subcylindric) capitula : the outer scales of the involucre are less than half the length of the innermost ; their shape and the number of flowers in each are accurately noted by Pursh."

§ 2. *Suffruticose : branches and heads corymbose : leaves obovate, punctate : scales of the few-flowered involucre few, imbricated : lobes of the corolla lanceolate : pappus unequal, barbellate.*—LEPTOCLINIUM, Nutt.

17. *L. fruticosa* (Nutt.) : glabrous ; branches naked above ; leaves spatulate-obovate, nerveless, entire ; heads about 5-flowered ; involucre cylindrical-campanulate, much shorter than the pappus ; the scales (12–14) lanceolate, acute, or acuminate, sprinkled with resinous globules ; achenia villous-pubescent.—*Nutt.! in Sill. jour.* 5. *p.* 299, & *in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 285.

East Florida, *Mr. Ware!*—Leaves scattered, (the lower opposite, the upper alternate, *Nutt.*) about an inch long, similar in shape to those of the common Purslane. Scales of the involucre imbricated in about 3 series ; the exterior shorter and more acuminate ; the innermost a little longer than the achenia, which are nearly 3 lines in length. Corolla purple. Pappus longer than the achenia, of numerous rather strongly barbellate bristles, some of which are much weaker and shorter than the others.—The achenia and pappus exactly agree with those of L. scariosa, and are about the same size : the receptacle is the same as in other few-flowered species.

§ 3. *Root a short rhizoma or caudex : leaves dilated, obovate, spatulate, or lanceolate, somewhat tripli-nerved or veined, not punctate with impressed dots : heads corymbose or paniculate-cymose, small, few-flowered : scales of the involucre few and slightly imbricated : corolla scarcely dilated above ; the lobes short, ovate : pappus minutely barbellate.*—TRILISA, Cass., DC. (excl. spec.)

18. *L. odoratissima* (Willd.) : glabrous ; leaves somewhat glaucous, obscurely veined ; the radical ones obovate-spatulate, tapering at the base, often slightly and obtusely toothed ; the cauline oblong, clasping at the base ; cyme corymbose-paniculate ; the heads numerous, pedicellate, 7–8-flowered ; scales of the involucre spatulate-oblong, glandular ; achenia scarcely pubescent.—*Willd.! spec.* 3. *p.* 1637 ; *Michx.! fl.* 2. *p.* 93 ; *Pursh, fl.* 2. *p.* 510 ; *Nutt.! gen.* 2. *p.* 132 ; *Andr. bot. rep. t.* 633 ; *Ell. sk.* 2. *p.* 283 ; *DC.! prodr.* 5. *p.* 131 ; *Don, in Brit. fl. gard.* (*ser.* 2) *t.* 184. Anonymos odoratissimus, *Walt. Car. p.* 198. Trilisa odoratissima, *Cass. dict.* 55. *p.* 310.

Pine barrens, Virginia (*Nuttall*) to Florida ! Alabama ! and Louisiana ! Sept.–Oct.—Stem 2–4 feet high, corymbose at the summit. Leaves thick, tripli-nerved, or with several veins proceeding from the midrib ; the radical ones large ; the upper small and scattered. Flowers bright purple. Achenia glandular.—The leaves when bruised exhale the odor of Vanilla, which in a dry state they retain for many years ; whence the popular name, *Vanilla-plant.*

19. *L. paniculata* (Willd.) : stem clothed with viscid hairs ; leaves 3–5-nerved, mostly glabrous ; the radical ones spatulate-lanceolate, tapering into a margined petiole ; the cauline very small and numerous, lanceolate or ovate-lanceolate, sessile, viscidly pubescent when young ; corymbs small, numerous, aggregated into a dense oblong panicle ; heads 4–10- (commonly 5-) flowered ; scales of the involucre lanceolate or linear-oblong, viscid ;

achenia minutely pubescent.—*Willd.! spec.* 3. *p.* 1637; *Michx.! l. c.*; *Pursh, l. c.*; *Nutt.! gen.* 2. *p.* 132; *Ell. sk.* 2. *p.* 283; *DC! l. c.* Anonymos paniculatus, *Walt.! Car. p.* 198.

Moist pine barrens, Virginia to Florida! common. Sept.–Oct.—Stem 1–2 feet high, virgate, purplish, somewhat villous or hirsute with glutinous hairs. Cauline leaves very small, appressed, almost imbricated. Heads as large as in the preceding species. Corolla purple, sometimes almost white. The scales of the involucre vary from 6 to 16, and the flowers from 4 to 10.

L. flexuosa of D. Thomas, in *Sill. jour.* 27. *p.* 338 (1839), is either L. cylindracea or a reduced L. squarrosa; it is impossible to determine which from the imperfect description and figure.

12. CLAVIGERA. *DC. prodr.* 5. *p.* 127.

Heads 5–20-flowered. Scales of the involucre imbricated in several series, striate; the exterior very short; the innermost elongated, linear. Receptacle narrow, naked. Corolla tubular, dilated at the base, not expanded above, 5-toothed; the teeth very short, glandular externally. Style with a villous bulb at the base; the branches terete or subclavate, mostly glabrous, included or partly exserted. Achenia somewhat cylindrical, striate (mostly 10-striate), nearly glabrous, sessile. Pappus a single series of plumose-barbellate bristles.—Somewhat shrubby branched (Mexican & Texan) plants. Leaves alternate, 1-nerved or tripli-nerved, linear or oblong, entire or toothed, sometimes dotted with resinous globules, or punctate. Heads in a corymbose or spicate panicle. Flowers whitish.

"A genus intermediate between Kuhnia and Liatris [but much nearer the former], dedicated, on account of the species being all natives of Mexico, to Franc. Xav. Clavigero, who wrote upon the natural as well as the civil history of Mexico." *DC.*—On the authority of Hænke's herbarium, De Candolle gives Mulgrave Sound as one of the localities of C. scoparia; but this is probably a mistake; and much confusion is said to exist respecting the localities of Hænke's plants.

1. *C. dentata* (DC.): pubescent, cinereous, shrubby; leaves oval-oblong, toothed, here and there somewhat lobed at the apex; branchlets leafy, bearing one or few heads disposed in a narrow panicle; heads 12-flowered; scales of the involucre linear-lanceolate, acuminate, ciliate, somewhat scarious at the apex, more or less striate. *DC. l. c.*

Texas, in the eastern districts (Cammancheries), and about Bexar, *Berlandier*, ex *DC.*—This species perhaps hardly comes within the prescribed limits of our Flora. We introduce it for comparison with the following, apparently different, species.

2. *C. Riddellii:* shrubby; the branches cinereous and minutely pubescent: leaves oblong-lanceolate, obscurely punctate; the lower ones tripli-nerved, reticulate-veined beneath, minutely pubescent, unequally serrate; those of the branches small, crenately toothed from the middle to the apex; heads 15–20-flowered, disposed in a leafy spike or thyrsus terminating the virgate branches; scales of the involucre pubescent and glandular, striate, obtuse, seldom mucronate; the exterior ovate; the inner lanceolate-linear, slightly scarious at the apex.

Interior of Texas, *Dr. Riddell!*—A much branched shrub, 4–6 feet high. Lower leaves slightly petioled. Spike or raceme nearly simple, dense, virgate; the heads scarcely exceeding the leaves from the axils of which they arise, the lower ones flowering earliest. Branches of the style partly exserted, clavate. Achenia about 10-striate.

13. KUHNIA. *Linn. spec. ed. 2. appx. p.* 1662; *Vent. Cels. t.* 91.

Kuhnia § Strigia, *DC.*—Critonia, *Gærtn.*, not of *R. Br.*

Heads 10–25-flowered. Scales of the involucre lanceolate, rather loosely imbricated in two or three series; the exterior shorter, acute or acuminate. Receptacle naked. Corolla tubular, somewhat dilated at the base, not expanded above, 5-toothed; the teeth short, obtuse, glandular externally. Style with a villous bulb at the base; the branches at length exserted, slightly clavate and somewhat flattened at the summit, glabrous. (Anthers sometimes abortive or unconnected?) Achenia nearly cylindrical, many-striate, sessile. Pappus a single series of strongly plumose bristles.—Perennial herbs or suffrutescent plants, with alternate or somewhat opposite 1-nerved or tripli-nerved lanceolate leaves, sprinkled with resinous dots beneath. Heads paniculate-corymbose. Flowers white or purple.

We have drawn the above character from the North American species alone, to which, with probably K. rosmarinifolia of Cuba (the section Strigia, *DC.*) the genus should doubtless be restricted: the species with pentagonal estriate achenia seem to be closely allied to Eupatorium, while Kuhnia proper is more near to Clavigera.—Kuhnia glutinosa of Elliott is placed by De Candolle in his section Leiogonia, and is referred by Hooker to Eupatorium altissimum, in both cases on the authority of specimens communicated by the author himself, who had inadvertently sent under that name the Eupatorium altissimum, a very different plant from the K. glutinosa of his herbarium (also long since sent to his correspondents in this country), and by no means agreeing with his published description, in which the pappus is said to be "beautifully feathered."—Kuhnia Arabica, *Hochst. & Steud.! pl. Arab. un. itin.; DC.! prodr.* 7. *p.* 267, is a species of Pegolettia, as Dr. Arnott first intimated to us.—Nothites, *Cass.* (of which we know a single species) is nearer Kuhnia than Mikania, but a distinct genus.

1. *K. eupatorioides* (Linn.): stem herbaceous; leaves, as well as the scales of the involucre, thickly sprinkled beneath with shining resinous dots, lanceolate; the cauline ones mostly irregularly serrate; those of the branches narrow and usually entire; heads in paniculate corymbs; flowers white or yellowish-white.—*Linn. l. c.* (excl. syn. *Pluk.*); *Linn. f. decad.* 2. *p.* 21, *t.* 11; *Darlingt.! fl. Cest. p.* 449. K. eupatorioides & K. Critonia, *Willd. spec.* 3. *p.* 1773. K. eupatorioides, dasypia, glutinosa, elliptica, tuberosa, fulva, (media, glabra,) & pubescens, *Raf.* Critonia Kuhnia, *Gærtn. fr.* 2. *p.* 411, *t.* 174, *f.* 7; *Michx.! fl.* 2. *p.* 101.

β. corymbulosa: lower surface of the leaves, and the branches, cinereous-pubescent; lower leaves ovate-lanceolate, irregularly serrate or sometimes laciniate-toothed; corymbs rather short and dense.—K. eupatorioides, *Ell. sk.* 2. *p.* 291; *DC. prodr.* 5. *p.* 126. K. glutinosa, *Ell.! l. c.*, not of *DC. prodr.!* K. suaveolens, *Fresenius, ind. sem. hort. Franc.* 1838.

γ. gracilis: leaves scarcely pubescent; the lower cauline ones lanceolate and more or less serrate; the others linear and mostly entire; corymbs loose, paniculate.—K. paniculata, *Cass. dict.* 24. *p.* 516; *DC.! l. c.* K. Critonia, *Ell. l. c., &c.*

Dry soil, New Jersey! and Pennsylvania! to Florida! Alabama! Louisiana! and Texas! Sept.–Oct.—Lower leaves frequently opposite. Achenia pubescent when young, nearly glabrous when mature. Pappus white or tawny.—The K. eupatorioides of Linnæus, and the Critonia Kuhnia of Gærtner were clearly founded on the same plant, and that the more common form in New Jersey and Pennsylvania, which is rather the K. Critonia of authors than K. eupatorioides; so that some changes in nomenclature would

be necessary if more than one species were admitted. But, considerable as is the difference between the extremes, we have a great variety of specimens forming such complete transitions that we are unable even to characterize a series of varieties. The involucre, corolla, achenia, &c. are precisely the same in all. We have, therefore, taken the more common northern plant as the type of the species, and have designated the extreme forms as varieties.

14. BULBOSTYLIS. *DC. prodr.* 5. *p.* 138.

Heads 10–25-flowered. Scales of the oblong or cylindrical-campanulate involucre rather loosely imbricated in about 3 series, striate; the exterior short, the inner lanceolate or linear. Receptacle narrow, naked. Corolla tubular, slender, somewhat dilated at the base, contracted at the summit, with 5 extremely short externally glandular teeth. Style with a commonly villous bulb at the base, included. Achenia nearly terete, or obscurely 5-angled, about 10-striate. Pappus of numerous capillary scabrous bristles, longer than the corolla.—Suffruticose (chiefly Mexican) plants, with terete branches. Leaves opposite or alternate, ovate or lanceolate, petioled, serrate, often dotted with resinous globules. Heads in thyrsoid or spicate leafy panicles. Flowers mostly white or ochroleucous.

Perhaps not sufficiently distinct from Brickellia; which again is distinguished from Eupatorium chiefly by its striate achenia.

1. *B. Californica:* stem and branches velvety-puberulent; leaves ovate, on short petioles, irregularly serrate-toothed, 3-nerved at the base, nearly glabrous above, dotted with minute glands and puberulent but scarcely reticulated beneath, the upper ones mostly alternate; heads in a spicate thyrsus, about 20-flowered; scales of the involucre obtuse; the exterior very short, appressed; the innermost linear, 1–2-nerved; achenia minutely pubescent.—B. Cavanillesii, *DC.! prodr.* 5. *p.* 138, partly (the Californian plant); *Hook. & Arn.! bot. Beechey, suppl. p.* 350.

California, *Douglas!*—Differs from the Mexican plant (*herb. DC.!*) as well in the leaves, which have not the upper surface scabrous, nor the lower reticulated, as in the obtuse scales of the involucre.

2. *B. microphylla* (Nutt.): much branched, viscidly pubescent and glandular; leaves alternate, ovate, petioled, sparingly toothed, tripli-nerved, equally pubescent and viscid on both sides; those of the branchlets very small, nearly sessile; heads about 15-flowered; exterior scales of the involucre with squarrose foliaceous tips; the interior erect, linear, 2–3-nerved, mucronulate.—*Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 287.

Oregon, on the Walla-wallah, *Nuttall!*—A low suffruticose plant; the leaves of the numerous branchlets only 2 or 3 lines long, rather thick, resembling those of some Asters. Heads small, scattered. Achenia not seen.

15. BRICKELLIA. *Ell. sk.* 2. *p.* 290.

Heads 30–50-flowered. Scales of the campanulate involucre imbricated, lanceolate or linear, striate; the exterior shorter. Receptacle naked, flat. Corolla tubular, slightly expanded towards the summit; the teeth short, obtuse, scarcely glandular externally. Style with a villous bulb at the base; the branches often much exserted, somewhat clavate, glabrous. Achenia

nearly cylindrical, about 10-striate. Pappus a single series of slender scabrous or minutely barbellate-serrulate bristles.—Perennial herbs (natives of the Southern United States and Oregon), sparingly branched; with opposite or alternate tripli-nerved leaves, and rather large corymbose heads. Flowers pale purple.

§ 1. *Leaves mostly opposite, cordate, crenate, petioled, 3-nerved from the base, veiny: involucre rather shorter than the flowers.*

1. *B. cordifolia* (Ell. l. c.): stem paniculate-corymbose at the summit; leaves all opposite, somewhat triangular-cordate, acuminate, minutely pubescent and thickly dotted with resinous globules beneath, crenate-toothed; corymb loose, the branches bearing 1–3 pedunculate heads; bracts setaceous; scales of the involucre rather rigid; the outermost subulate, loose or bracteolate, somewhat shorter than the obtuse oblong-linear imbricated interior ones; branches of the style much exserted; achenia nearly glabrous: pappus (purplish) persistent.—Eupatorium Brickellia, *DC. prodr.* 5. *p.* 182.

Hill-sides, western districts of Georgia, *Elliott.* Middle Florida, *Dr. Chapman!* Aug.–Sept.—Stem about 3 feet high, terete. Leaves about 3 inches long; the uppermost merely truncate at the base. Heads half an inch long, 40–50-flowered. Style with a depressed villous bulb. Achenia when young minutely hairy towards the summit.

2. *B. grandiflora* (Nutt.): stem paniculate at the summit; leaves cordate-triangular, acuminate, pubescent or nearly glabrous, dotted with resinous globules beneath, coarsely or incisely dentate-serrate; the lower mostly opposite, the others alternate; heads subsessile and glomerate (3–5 together) on the simple branches of the panicle; scales of the involucre imbricated in several series; the inner ones linear-oblong, rather acute; the exterior short, ovate, appressed, produced into a subulate spreading appendage; branches of the style slightly exserted; achenia glabrous when mature; pappus (white) deciduous.—*Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 287. Eupatorium? grandiflorum, *Hook. fl. Bor.-Am.* 2. *p.* 26.

Low hills between the north and south branches of Lewis & Clarke's River, Oregon, *Douglas*; and from this region to the Rocky Mountains, *Nuttall!* Upper plains of the Platte? *Dr. James!*—Manifestly allied to the preceding species; the heads about the same size. Flowers white, according to Hooker; but evidently tinged with purple in the specimen of Dr. James.

§ 2. *Leaves all alternate, oblong-lanceolate, small, sessile, not sprinkled with resinous dots, obscurely tripli-nerved, entire: inner scales of the involucre longer than the flowers.*

3. *B. oblongifolia* (Nutt.): slightly viscid-puberulent; leaves numerous, narrowly oblong, mucronulate, tapering to the base, scarcely veined; heads solitary or 2–3 together, terminating the corymbose-paniculate leafy branches; scales of the involucre imbricated in 3 or 4 series; the exterior shorter, lanceolate-oblong, often obtuse; the interior linear, elongated, acute or mucronate; branches of the style scarcely exserted; achenia slender, minutely puberulent.—*Nutt.! l. c.*

Gravel bars of the Oregon and Wahlamet, *Nuttall!*—Leaves about an inch long. Heads 8–10 lines in length. Habit different from the other species. The plant is viscid, and has a heavy odor, according to Nuttall; who states that the flowers are yellowish [ochroleucous?].

16. EUPATORIUM. *Tourn. inst. t.* 259; *Linn.*; *Gærtn. fr. t.* 166; *DC. prodr.* 5. *p.* 141.

Heads 3–100-flowered. Involucre cylindrical or campanulate; the scales imbricated in 2–3 or more series, or sometimes nearly equal in a single series. Receptacle flat, naked. Corolla tubular-infundibuliform or often with a campanulate limb, 5-toothed, frequently dilated at the base. Anthers included. Branches of the style mostly exserted and elongated, cylindraceous or somewhat flattened, obtuse. Achenia 5-angled, without intermediate striæ. Pappus a single series of very slender capillary bristles, scabrous or minutely serrulate.—Perennial herbs or somewhat shrubby plants (the greater portion American), with opposite (sometimes alternate or verticillate) simple or rarely divided leaves. Heads mostly corymbose. Flowers purple, blue, or white. Leaves, involucre, corolla, and achenia often sprinkled with resinous globules; the former rarely impressed-punctate.

§ 1. *Heads cylindrical, 5–60-flowered: scales of the involucre numerous, closely imbricated in several series, appressed, obtuse, strongly striate; the outer ones shortest: leaves opposite or rarely alternate.*

1. *E. ivæfolium* (Linn.): herbaceous; stem terete, somewhat hispid; leaves opposite, narrowly lanceolate, tapering to each end, scarcely petioled, 3-nerved, subserrate, glabrous; corymb trichotomous, loose; heads oblong, pedicellate, 15–20-flowered; scales of the involucre few, erect, striate, obtuse. *DC.*—*Linn. amœn. acad.* 5. *p.* 405, & *spec.* (*ed.* 2.) 2. *p.* 1174; *Swartz, obs. p.* 301; *DC. prodr.* 5. *p.* 146.

β. Ludovicianum: leaves less attenuated at each end, often rather obtuse; the uppermost short and nearly sessile; corymbs more dense.—E. neurolepis, *Torr.! herb.* E. calocephalum, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 286. Liatris oppositifolia, *Nutt.! in Sill. jour.* 5. *p.* 299.

Open woods or fields, Louisiana, near New Orleans, *Tainturier! Nuttall! Dr. Ingalls! Dr. Riddell!* Jackson, *Dr. Carpenter!* and Alexandria, Western Louisiana, *Dr. Hale!* July–Nov.—Stem branched, 3–5 feet high. Lower leaves about 2 inches long, broadly lanceolate, rather sparingly serrate; those of the numerous branchlets very short. Corymbs with 6–20 heads, more contracted than in the West Indian plant. Scales of the involucre about 20; the inner ones somewhat dilated and colored (purplish) at the summit. Flowers light purplish-blue.—We have only seen West Indian specimens of E. ivæfolium *β. DC.*; which has more pointed leaves than our plant, but appears scarcely to differ in other respects. This is our only representative of a large and marked group of tropical American species.

§ 2. *Heads cylindrical, 5–10-flowered: scales of the involucre numerous, colored, obtuse, slightly striate, imbricated in several series; the outermost much shortest (style bulbous at the base): herbaceous: leaves large, mostly verticillate: flowers purplish.*

2. *E. purpureum* (Linn.): stem stout, simple, fistular or nearly solid, pubescent or glabrous; leaves (3–6-nately) verticillate or rarely opposite, oblong-ovate or lanceolate, more or less petioled, acuminate, veiny, scabrous or glabrous above, somewhat pubescent beneath and minutely dotted with resin-

ous globules, serrate, the teeth mucronulate; heads in a large compound corymb, 5–9- (rarely 3–12-) flowered; achenia glabrous and more or less glandular.—*Linn.! spec.* (*ed.* 1) 2. *p.* 838; *Hook.! fl. Bor.-Am.* 1. *p.* 304; *Darlingt. fl. Cest. p.* 453. E. trifoliatum, *Linn.! l. c.* E. purpureum, maculatum, verticillatum, ternifolium, & dubium, *DC.! prodr.* 5. *p.* 151.

α. stem tall, somewhat glabrous and glaucous, purple at the nodes (and sometimes throughout); leaves (5–6 in a whorl) large, oblong-ovate, coarsely serrate, somewhat petioled, often rugosely veiny; corymb very large, convex.—E. purpureum, *Linn.! l. c.* (excl. *β.*) & *ed.* 2. *p.* 1173; *Willd.! spec.* 3. *p.* 1759 (partly); *Ell. l. c.? &c.*; *DC.! l. c.* E. verticillatum, *Willd.! l. c.* (herb. fol. 1, & 2!) E. trifoliatum, *Darlingt.! l. c.*

β. maculatum (Darlingt.! l. c.): stem mostly striate or grooved, pubescent and often glandular or viscid above, punctate with purple linear spots; leaves (mostly ternate or quaternate) ovate, slightly tripli-nerved, petioled; corymb dense, depressed.—E. purpureum, *β. Linn.! l. c. ed.* 1. E. maculatum, *Linn.! amœn.* 4. *p.* 288, & *spec. ed.* 2. *p.* 1174; *Willd.! l. c.*; *Michx.! fl.* 2. *p.* 99; *Bart. fl. Amer. Sept. t.* 102; *Ell. l. c.*; *DC.! l. c.* E. punctatum, *Willd.! enum.* 2. *p.* 853; *Pursh, fl.* 2. *p.* 515. E. amœnum, *Pursh! l. c.*—Varies, with the leaves strongly rugose and scabrous-pubescent both sides, or nearly smooth and glabrous; either acute or acuminate at each end (E. maculatum, *Ell. l. c.*); or obtuse at the base, and pubescent and glandular beneath, as also the scales of the involucre (E. ternifolium, *Ell. l. c.*; *DC. l. c.*); or with the leaves scarcely acuminate, the involucre glabrous and about 3-flowered (E. dubium, *Poir.*, *DC.*); or occasionally with the lower leaves ternate, the upper opposite, the uppermost sometimes even alternate (E. amœnum, *Pursh, l. c.*); and by other forms with a slightly punctate stem, elongated (mostly ternate) ovate-lanceolate leaves, acuminate at both ends and coarsely serrate, (E. trifoliatum, *Linn.*, *Darlingt. l. c.*) approaching the original E. purpureum, so as to be undistinguishable from its more slender states.

γ. angustifolium: stem tall, glabrous and somewhat glaucous, or pubescent at the summit, sparingly punctate with linear spots; leaves (commonly 5 or 6 in a whorl), petioled, evenly and rather finely serrate; the lower ones oblong-lanceolate; the upper linear-lanceolate; corymb compound, paniculate-thyrsoid, loose.—E. lævigatum, *Torr.! cat. pl. New York.*—Varies (in shady places,) with the heads and flowers nearly white, the leaves membranaceous and more deeply serrate, &c.; when it is E. falcatum, *Michx.! fl.* 2. *p.* 99.

Low grounds, thickets, and swamps, Canada! from the Saskatchawan, and throughout the United States! Aug.–Sept.—Stem 3–7 or even 10 feet high. Involucre purplish or whitish; the scales 12–18, obtuse; the exterior very short, closely imbricated, pubescent; the others linear-oblong and linear, scarious, 2–3-nerved, shorter than the flowers. Corolla infundibuliform-tubular; the lobes ovate-lanceolate, short, light purple or flesh-color. Style with a small globose pubescent bulb at the base; the branches very much exserted.—This plant is sometimes employed medicinally, as a tonic.

§ 3. *Heads* 3–*many-flowered: scales of the somewhat cylindrical or campanulate involucre* 8–15, *more or less imbricated; the exterior shortest: leaves opposite, sometimes verticillate or alternate.* (*Stem herbaceous, flowers white, and the corolla, achenia, &c. more or less dotted with resinous globules in all the North American species.*)

* *Paniculate: heads* 3–5-*flowered: leaves alternate, pinnately lobed.*

— 3. *E. fœniculaceum* (Willd.): paniculately very much branched; stem

puberulent; leaves alternate, linear-filiform, glabrous; the lower pinnately or bipinnately parted; the upper fascicled, entire; heads very numerous, small, 3–5-flowered, on short pedicels; scales of the involucre 8–10; the exterior very short; the inner mucronulate-acuminate, glabrous, slightly margined; achenia glabrous.—*Willd.! spec.* 3. *p.* 1750; *Pursh! fl.* 2. *p.* 512; *Ell. sk.* 2. *p.* 294; *DC.! prodr.* 5. *p.* 176. E. fœniculoides, *Walt. Car. p.* 199. Chrysocoma capillacea, *Michx.! fl.* 2. *p.* 101.

β. glabrum: stem and branches glabrous; the racemose-spicate divisions of the panicle somewhat fastigiate.—E. leptophyllum, *DC.! l. c.*

γ. lateriflorum: slightly pubescent; branchlets of the panicle loose, with rather few and scattered heads, borne towards the base of leafy branches.—E. fœniculaceum *β.* traganthes, *DC.! l. c.* (at least partly.)

Fields, in damp soil, mostly near the coast, Virginia! and N. Carolina! to Florida! *β.* Georgia, *Mr. Herbemont!* (in *herb. Duby & DC.*) &c. Florida, *Dr. Leavenworth!* *γ.* Middle Florida, *Dr. Chapman!* Sept.–Oct.—Stem 3–10 feet high; the branches terminated by the elongated compound panicles. Flowers yellowish-white, (sometimes sprinkled with purple, *Ell.*), very small. Corolla tubular-infundibuliform; the teeth very short, minutely glandular externally. Anthers as long as the corolla: the stamens not very short, as described by Elliott. Branches of the style much elongated and exserted, minutely papillose. Achenia angled as in E. coronopifolium (not cylindrical).—The E. fœniculaceum *β.* of De Candolle seems a cultivated state of our var. *γ.*, which is a somewhat remarkable form; the heads however being only 5-flowered.—*Dog-Fennel.*

4. *E. coronopifolium* (Willd.): paniculately branched; stem pubescent; leaves mostly alternate, pubescent or nearly glabrous, punctate; the lower ones pinnately 3–7-lobed, the lobes linear; the others linear, mostly entire, fascicled or crowded; heads numerous, scarcely pedicelled, 5-flowered; scales of the involucre about 10, lanceolate, mucronulate, slightly pubescent, with scarious margins; the exterior short and imbricated; achenia glabrous.—*Willd.! spec.* 3. *p.* 1750; *Pursh, l. c.*; *Ell. sk.* 2. *p.* 294; *DC.! prodr.* 5. *p.* 176. E. compositifolium, *Walt. Car. p.* 199. Chrysocoma coronopifolia, *Michx.! fl.* 2. *p.* 102.

Dry barren soil, N. Carolina to Florida! Alabama! and Texas! Sept.–Oct.—Stem 3–4 feet high; the branches of the panicle rather short and dense. Flowers about twice the size of those of E. fœniculaceum, white; the corolla, achenia, pappus, &c. similar. Style with a minute bulb at the base.

* * *Corymbose: heads* 5–15- (*rarely more than* 20-) *flowered.*

† Leaves sessile or nearly so, not clasping or connate: heads 5- (rarely 7–9-) flowered.

5. *E. pinnatifidum* (Ell.): pubescent; stem fastigiately corymbose at the summit; leaves laciniate-pinnatifid, with the segments linear and entire or toothed, pubescent beneath, sprinkled with shining resinous dots; the lower ones quaternately verticillate, the others opposite or mostly alternate; heads small, very numerous, 5–9-flowered; scales of the involucre 8–10, linear-oblong or lanceolate, mucronulate, pubescent and sprinkled with resinous dots; achenia sparsely glandular.—*Ell. sk.* 2. *p.* 295; *DC. prodr.* 5. *p.* 176, but not of *p.* 149.

Damp soil in the middle districts of Carolina, *Elliott.* Middle Florida, *Dr. Chapman!* Sandy woods of N. Carolina, *Mr. Curtis!*—Stem 3–4 feet high. Leaves lanceolate, 1–3 inches long, deeply and unequally laciniate-pinnatifid, nearly glabrous above, minutely pubescent and more conspicuously dotted with shining globules beneath; the lower segments elongated and usually toothed or laciniate. Branches of the fastigiate corymb loose;

the heads not larger than in E. coronopifolium. Corolla infundibuliform, attenuate below, and abruptly dilated at the base; the teeth very short, ovate, glandular externally. Pappus as long as the corolla. Achenia dotted with scattered resinous globules.—Our plant appears to be that of Elliott, although we have never seen the lower verticillate leaves, and the heads are mostly 7–9-flowered. The styles also in our specimens are often all included within the corolla at every stage, and with short very obtuse lobes. Two or three flowers of each head, however, often present the branches of the style elongated and much exserted, as described by Elliott. The same thing occurs in several of the succeeding species, and in Kuhnia eupatorioides, where the style is usually included until a late period.

6. *E. hyssopifolium* (Linn.): stem minutely pubescent, simple or branched, loosely corymbose at the summit; leaves opposite or verticillate, and often fascicled in the axils, the uppermost alternate, linear or lanceolate, rather obtuse, tapering or acute at the base, minutely pubescent, punctate on both sides, 3-nerved, the upper ones 1-nerved, entire, the lower ones sparingly toothed or serrate; heads 5-flowered; scales of the involucre 10, shorter than the flowers, very pubescent, glandular; the outer ones short; the others linear-oblong, obtuse, with slightly scarious margins; achenia glabrous and usually glandular.—*Linn.! spec.* 2. *p.* 836 (pl. *Dill. Elth. & Pluk.! t.* 88, *f.* 2.); *Willd.! spec.* 3. *p.* 1749; *Ait.! Kew.* (*ed.* 2) 4. *p.* 505. E. linearifolium & E. hyssopifolium (chiefly), *DC.! prodr.* 5. *p.* 177. E. linearifolium, *Walt.! Car.* *p.* 199; *Michx.! fl.* 2. *p.* 97 (chiefly); *Willd.! l. c.*; *Ell. sk.* 2. *p.* 296?

β. leaves mostly verticillate, very narrowly linear, elongated, entire.

γ. leaves seldom verticillate; the lower ones rather broadly lanceolate, somewhat veined, coarsely serrate-toothed.—E. linearifolium, *Michx.! l. c.* (partly.) E. hyssopifolium, *DC.! l. c.* (partly.)

δ. leaves usually ternately verticillate, lanceolate, rather large and thin, serrate-toothed.—E. Torreyanum, *Short! cat. Kentucky plants, 2nd suppl.*

Dry mostly sterile soil, from the coast of Massachusetts! and New Jersey! to Florida! and Western Louisiana! *β.* Middle Florida, *Dr. Chapman!* *γ.* Southern States! *δ.* "Knobs among the barrens near the Mammoth Cave, Kentucky," *Dr. Short!*—Stem 1–3 feet high, usually very leafy. Leaves commonly 1½–2 inches long, rather thick and rigid; the lateral nerves somewhat anastomozing, approximate to the mid-nerve in the narrower leaves, nearly wanting in the narrowest. Compound corymb rather loose, often fastigiate. Corolla dilated at the base, as in numerous species, cyathiform or campanulate at the summit; the lobes ovate, very short. Style usually much exserted.—The Linnæan species was founded on the narrower-leaved plant (E. linearifolium, *DC.*), in which the lower leaves are always 3-nerved, and often toothed; this passes insensibly into our var. *γ.*, the extreme forms of which appear abundantly different, but Michaux has justly united them. Our two varieties *β.* & *δ.* taken by themselves, would never be thought the same species, but we are unable to separate them.

7. *E. leucolepis:* stem mostly simple, puberulent; leaves opposite, divaricate, lanceolate or linear, obtuse, closely sessile, serrate, very scabrous on both sides, punctate, strongly 1-nerved; the lower ones obscurely 3-nerved or somewhat veiny; corymb fastigiate, canescent; heads 5-flowered; scales of the involucre 8–10, lanceolate, acute or acuminate, very pubescent and glandular on the back, white and scarious at the summit, as long as the flowers; achenia minutely glandular.—E. glaucescens *β.* leucolepis, *DC.! prodr.* 5. *p.* 177. E. linearifolium, *Michx. l. c.* partly (*ex herb.!*); *Pursh! fl.* 2. *p.* 513 (partly); *Nutt.! gen.* 2. *p.* 135. E. hyssopifolium, *Ell. sk.* 2. *p.* 296?

Damp sandy soil, pine barrens of New Jersey! to Georgia! Florida!

Alabama! and Western Louisiana! Aug.–Oct.—Stem 2–3 feet high. Leaves spreading or divaricate, rather rigid, perhaps never verticillate, seldom fascicled in the axils, the uppermost rarely alternate, both surfaces of a pale glaucous hue, the midrib prominent beneath; the lower ones 2 or rarely 3 inches in length, and from one-fourth to nearly half an inch wide, serrate with appressed teeth; the upper narrower and more finely serrate, or sometimes entire. Corolla, &c. nearly as in E. hyssopifolium. Appendages of the anthers short, obtuse. Branches of the style exserted.—This has sometimes been confounded with E. hyssopifolium, but is readily distinguished as well by the leaves as by the very scarious and acute scales of the involucre.

8. *E. cuneifolium* (Willd.): pubescent; stem simple or branching, loosely corymbose at the summit; leaves very short, opposite, or the uppermost frequently alternate, obovate-oblong, spatulate or oblong-lanceolate, acute or attenuate at the base, slightly petioled, tripli-nerved or 3-nerved from the base, pubescent and punctate on both surfaces, mostly obtuse, and with a few obtuse serratures towards the apex; heads 5-flowered, somewhat crowded on the loose tomentose branchlets of the corymb; scales of the involucre 8–10, very pubescent, sprinkled with glands, obtuse; achenia slightly glandular.—*Willd.! spec.* 3. *p.* 1753, not of *DC.!* E. glaucescens, *Ell.! sk.* 2. *p.* 303. E. linearifolium, *Michx.* (partly, *ex herb.!*) E. hyssopifolium, *DC.! prodr.* 5. *p.* 177, partly.

Shady places, S. Carolina! Georgia! Alabama! and Florida! Aug.–Sept.—Stem about 2 feet high, erect or ascending at the base. Leaves about an inch long, of a pale glaucous hue on both sides, very obtuse, the uppermost sometimes acute, entire and cuneiform at the base, usually with 2–4 obtuse teeth on each side towards the summit. Involucre, flowers, pappus, &c. nearly as in E. hyssopifolium.

9. *E. parviflorum* (Ell.): minutely velvety-pubescent, branching; leaves opposite, or the lower sometimes ternate, and the upper frequently alternate (sometimes verticillate, opposite, and alternate on the same specimen), lanceolate or oblong, minutely punctate, tripli-nerved, somewhat reticulate-veined, unequally and acutely serrate, usually entire below the middle, tapering to the base, the lower slightly petioled; corymbs numerous; heads (small) crowded, 5-flowered; scales of the involucre 8–10, in a double series, pubescent and glandular; the exterior very short; the interior linear, obtuse; achenia glabrous or minutely glandular.—*Ell.! sk.* 2. *p.* 299, (not of *Swartz*, which is Critonia parviflora; nor of *Aublet*, which is a Mikania.) E. cuneifolium, *DC.! prodr.* 5. *p.* 177, not of *Willd.!* E. semiserratum, *DC.! l. c.* E. ambiguum, *Hook.! compan. to bot. mag.* 1. *p.* 96. Critonia elliptica, *Raf.! in herb. DC., & herb. Durand.*

β. lancifolium: stem or branches strict, glabrous below, corymbose at the summit; leaves opposite (sometimes ternate), lanceolate, rather rigid, almost glabrous, acute, serrulate above the middle, tripli-nerved or 3-nerved; the nerves sparingly anastomozing.

Damp soil, Virginia! to Georgia! Florida! Alabama! and Western Louisiana! *β.* Louisiana, *Dr. Leavenworth!* Louisiana and Texas, *Drummond!* Aug.–Oct.—Stem 2–3 feet high, usually diffusely branched above. Leaves pale, minutely velvety-pubescent beneath, 2–3 inches long, often an inch wide, varying from scarcely acute to acuminate, sometimes serrate nearly to the base; the texture rather firm. Heads about as large as in E. coronopifolium, crowded. Involucre shorter than the flowers.—In our var. *β.* the leaves are smaller, nearly glabrous, and rather narrowly lanceolate, resembling the upper leaves of E. parviflorum, with which it agrees in other respects. We had considered it a new species, but having observed various intermediate states, we are satisfied that it is a mere variety of *E.* parviflorum. The E. ambiguum of Hooker is said to have 8–10-flowered involu-

cres; we find only 5 in specimens distributed from Drummond's collection; but two heads may occasionally become confluent, as happens in some other species.

10. *E. altissimum* (Linn.): stem stout, tomentose-pubescent, corymbosely branched at the summit; leaves opposite, nearly sessile, lanceolate, somewhat tapering to each end, conspicuously 3-nerved, pubescent, acutely and rather remotely serrate above the middle; the uppermost often entire, and sometimes alternate; corymbs numerous; heads glomerate, 5-flowered; scales of the involucre about 10, linear-oblong, obtuse, pubescent or tomentose and glandular, imbricated, shorter than the flowers; achenia obscurely angled, somewhat glandular.—*Linn.! spec.* 2. *p.* 837; *Jacq. hort. Vindob. t.* 164; *Ait.! Kew.* (*ed.* 1) 3. *p.* 159; *Willd.! spec.* 3. *p.* 1754; *Michx.! fl.* 2. *p.* 97; *Pursh! fl.* 2. *p.* 514; *DC.! prodr.* 5. *p.* 177. E. rupestre & E. Floridanum, *Raf.!* Kuhnia glutinosa, *DC.! prodr.* 5. *p.* 127 (spec. *Ell.!*), not of *Ell.! sk.*

Woods and barren soil, Pennsylvania, Ohio! and throughout the Western States! and the western portion of the Southern States! "Florida," *Rafinesque!* Sept.–Oct.—Stem 3–7 feet high. Leaves 3–4 inches long, resembling some species of Solidago, minutely dotted, pubescent or sometimes almost tomentose. Heads rather large. Lobes of the corolla ovate-lanceolate. Style slightly enlarged and pubescent at the base; the branches elongated and thickened. Pappus somewhat remotely scabrous-serrulate.

11. *E. album* (Linn.): stem pubescent, corymbose at the summit; leaves opposite, sessile, broadly lanceolate, coarsely serrate-toothed, veiny, punctate, more or less pubescent and scabrous; branches of the corymb fastigiate, erect; heads 5-flowered, glomerate; scales of the involucre 10–14, closely imbricated, narrowly lanceolate, acuminate, rigid, white and scarious above, mostly longer than the flowers; the exterior usually pubescent and at length dotted with dark resinous globules; achenia glandular.—*Linn.! mant. p.* 111; *Walt. Car. p.* 199; *Willd.! spec.* 3. *p.* 1752; *Ell. sk.* 2. *p.* 296; *DC.! prodr.* 5. *p.* 178. E. glandulosum, *Michx.! fl.* 2. *p.* 98.

Sandy and barren fields, Pennsylvania and New Jersey! to Florida! and Louisiana! Aug.–Oct.—Stem about 2 feet high, varying, as also the leaves, from minutely pubescent to hirsute-villous. Leaves either narrowly or very broadly lanceolate, often very deeply serrate; the veins reticulated beneath. Involucre, corolla, and achenia, when old, copiously sprinkled with resinous globules; in which state it is the E. glandulosum, *Michx.* Lobes of the corolla ovate-lanceolate. Style more commonly included, but sometimes manifestly exserted. Pappus densely barbellate-serrulate.

12. *E. teucrifolium* (Willd.): stem roughish-pubescent, corymbose at the summit; leaves opposite (the uppermost very frequently alternate), sessile, ovate-oblong and ovate-lanceolate, obtuse or truncate at the base, slightly tripli-nerved, veiny, somewhat pubescent and scabrous, obscurely punctate, coarsely serrate-toothed particularly towards the base; the uppermost nearly entire; branches of the corymb few, often alternate; heads glomerate, 5-flowered; scales of the involucre 10, pubescent, oblong-lanceolate, scarcely acute; the interior at length shorter than the flowers; achenia glandular.—*Willd.! spec.* 3. *p.* 1753, & *hort. Berol. t.* 32; *Pursh, fl.* 2. *p.* 513; *DC.! prodr.* 5. *p.* 178. E. pilosum, *Walt. Car. p.* 199? E. verbenæfolium, *Michx.! fl.* 2. *p.* 98; *Ell. sk.* 2. *p.* 301; *Bigel. fl. Bost. ed.* 2. *p.* 296; *Darlingt.! fl. Cest. p.* 450. E. lanceolatum, *Muhl.! in Willd. l. c.* (*herb. Willd. fol.* 2! not *fol.* 1.) & *in herb. Ell.!* E. pubescens, *Bigel.! l. c.*, not of *Muhl.* & *Willd.*

Borders of swamps and thickets, Massachusetts! New Jersey! and Pennsylvania! to Alabama! and Louisiana! Aug.–Sept.—Stem 2–3 feet high, rather slender. Leaves 2–4 inches long, variable as to the serratures, which

are often very coarse and irregular, sometimes even and more numerous; the upper leaves small, usually lanceolate or deltoid-lanceolate, tapering from the base to the apex, but usually rather obtuse, often entire, except a few coarse teeth near the base, occasionally deeply incised. Corymbs small and dense, often somewhat paniculate. Scales of the involucre with scarious margins, little longer than the mature achenia.—The specific name of Willdenow and that of Michaux were published during the same year (1803).

13. *E. rotundifolium* (Linn.): stem densely pubescent, corymbose at the summit; leaves opposite, roundish-ovate, mostly obtuse, truncate or somewhat cordate at the base, sessile, tripli-nerved, veiny, scabrous and pubescent, pale or somewhat hoary and glandular beneath, deeply crenate-toothed; corymb fastigiate; heads 5-flowered; scales of the involucre 8–10, very pubescent, glandular; the exterior very short; the interior linear-lanceolate, abruptly acute or acuminate, scarcely shorter than the flowers; achenia glandular.—*Linn.! spec.* 2. *p.* 837; *Willd.! spec.* 3. *p.* 1754; *Michx.! fl.* 2. *p.* 98 (partly); *Ell. sk.* 2. *p.* 300; *Hook. fl. Bor.-Am.* 1. *p.* 304; *DC.! prodr.* 5. *p.* 178. E. Marubium, *Walt. Car. p.* 199, ex *Ell.* Eupatoria valerianoides Virginiensis, &c. *Pluk.! alm. p.* 141, *t.* 88, *f.* 4.

Dry sterile soil, particularly in pine barrens, (Canada, *Pursh*, *Mr. Goldie*,) New Jersey! to Florida! Louisiana! and Texas! July–Sept.—Stem 2–3 feet high, slender. Leaves 1–2 inches long. Pappus a little longer than the corolla.—*Wild Hore-hound.*

14. *E. pubescens* (Muhl.): stem very pubescent or somewhat hirsute, corymbosely branched at the summit; leaves opposite, ovate, mostly acute, slightly truncate at the base, sessile, somewhat tripli-nerved, veiny, more or less pubescent, slightly scabrous, obscurely glandular-punctate, dentate-serrate; corymb fastigiate; heads 7–8-flowered; scales of the involucre 10–14, pubescent and glandular; the exterior very short; the interior lanceolate, acute, rather shorter than the flowers; achenia glandular.—*Muhl. in Willd.! spec.* 3. *p.* 1755; *Willd.! enum.* 2. *p.* 852; *Pursh, fl.* 2. *p.* 514 (excl. syn. *Michx.*); *Ell. sk.* 2. *p.* 301; *DC. prodr.* 5. *p.* 178? E. scabridum, *Ell. l. c. p.* 299? E. ovatum, *Bigel. fl. Bost. ed.* 2. *p.* 296. E. rotundifolium *β.*? ovatum, *Torr.! in DC. l. c.* E. obovatum, *Raf. in med. repos.* (*hex.* 2) 5. *p.* 359.

Massachusetts! New Jersey! Pennsylvania, and probably in the Southern States, in similar situations with the preceding. Aug.–Sept.—Stem 2–4 feet high, usually a stouter and more branching plant than E. rotundifolium. Leaves broadly ovate or ovate-oblong, 2–3 inches long and about 1½ wide near the base, rather obtusely and coarsely serrate; the teeth (as in the preceding) either simple and equal, or occasionally unequal, thus becoming somewhat doubly serrate. Scales of the involucre with scarious summits. Corolla, pappus, &c. as in E. rotundifolium, which it sometimes approaches perhaps too closely; but the heads appear to be uniformly more than 5-flowered.—The specimens in Willdenow's herbarium (particularly fol. 2.) certainly belong to this species; but that author states the heads to be 5-flowered.

† † Leaves closely sessile or partly clasping at the base, or sometimes connate: heads 10–20- (rarely 5-) flowered.

15. *E. sessilifolium* (Linn.): glabrous; stem corymbosely branched above; leaves opposite, closely sessile or partly clasping, distinct, rounded at the base, lanceolate or ovate-lanceolate, tapering from near the base to the acuminate apex, sharply serrate, veiny, obscurely punctate and paler beneath; corymb compound, pubescent; heads 5-flowered; scales of the involucre 10, imbricated somewhat in a triple series, oval or oblong, obtuse, canescently

pubescent, glandular; achenia minutely glandular.—*Linn.! spec.* 2. *p.* 837; *Willd.! spec.* 2. *p.* 1751; *Michx.! fl.* 2. *p.* 98; *Pursh! fl.* 2. *p.* 513; *Ell. l. c.*; *Bigel. fl. Bost. ed.* 2. *p.* 295; *Darlingt. fl. Cest. p.* 451; *DC.! prodr.* 5. *p.* 151. E. truncatum, *Ell. sk.* 2. *p.* 298.

Borders of thickets, Massachusetts! New York! Pennsylvania! and along the Alleghany Mountains to Georgia! and Alabama! Aug.–Sept.—Stem 2–4 feet high, much branched above. Leaves often 6 inches long, variable in breadth, and in the teeth (which are either fine or coarse), glabrous. Heads, according to De Candolle, 5–12-flowered, but we have only observed the smaller number. Lobes of the corolla ovate-lanceolate. Style moderately exserted; the base minutely bulbous and villous.

16. *E. perfoliatum* (Linn.): stem stout, very pubescent or villous-hirsute, corymbosely branched above; leaves opposite, connate-perfoliate, divaricate, lanceolate, elongated, tapering gradually from the base to the acuminate apex, obtusely serrate, veiny, the veinlets reticulated beneath, rugose, pubescent, the lower surface usually almost tomentose-pubescent and sprinkled with resinous dots; corymb fastigiate, compound; the heads commonly 10-flowered; scales of the involucre 12–15, very pubescent, glandular, imbricated; the inner ones linear-lanceolate, with scarious tips; achenia glabrous or minutely glandular.—*Linn.! spec.* 2. *p.* 838; *Willd.! spec.* 3. *p.* 1761; *Pursh! l. c.*; *Ell. sk.* 2. *p.* 302; *Bigel.! med. bot.* 1. *p.* 38, *t.* 2, & *fl. Bost. ed.* 2. *p.* 297; *Raf. med. bot. t.* 36; *Darlingt.! fl. Cest. p.* 451; *Hook. fl. Bor.-Am.* 1. *p.* 305; *DC.! prodr.* 5. *p.* 151.

β. leaves glabrous above, pubescent only on the midrib and veins of the lower surface; heads 25–40-flowered!

γ. leaves glabrous above, more or less pubescent beneath; the upper distinct and truncate at the base; the uppermost frequently alternate.—E. truncatum, *Muhl. in Willd.! spec.* 3. *p.* 1751; not of *Ell.*, scarcely of *DC.* E. salviæfolium, *Bot. mag. t.* 2010.

δ. smaller; leaves mostly narrowed at the base, distinct or slightly connate.—E. cuneatum, *Engelmann! mss.*

Swampy grounds, Canada! Upper Missouri! and throughout the United States! abundant. *δ.* Arkansas, near Little Rock, *Dr. Engelmann!* July–Sept.—Stem 2–4 feet high. Leaves often 6–8 inches long, usually perfectly connate at the base, where they are widest, decussate, rarely ternate and connate in the same manner. Lobes of the corolla ovate, short.—This is the well-known *Boneset* or *Thorough-wort*, so universally employed in popular medicine. Our var. *β.* may be considered as an accidental state, produced by the confluence of several heads into one, and the scales of the involucre are likewise increased in number. The same thing we suspect sometimes occurs in E. sessilifolium, and perhaps in other species. The E. truncatum of Muhlenberg and Willdenow, according to herbarium of the latter, is nothing more than a form of this species with the upper leaves disjoined and smoother.

18. *E. resinosum* (Torr.): stem velvety-puberulent, simple, or corymbosely branched at the summit; leaves opposite, closely sessile or partly clasping at the base, linear-lanceolate, elongated, spreading or divaricate, attenuate-acuminate, evenly serrate, 1-nerved, pinnately veined, nearly glabrous above, minutely velvety-canescent beneath, both surfaces glandular and somewhat viscid with resinous globules; corymb fastigiate, compound; heads glomerate, 10–15-flowered; scales of the involucre oval, obtuse, imbricated, tomentose-canescent and glandular; achenia minutely roughened with dark resinous globules.—*Torr.! in DC. prodr* 5. *p.* 176.

Swamps and wet soil in the pine barrens of New Jersey, near Quaker Bridge and Wading River! Also "Pennsylvania," *Bartram!* (in *herb. Banks.* under the name of E. canescens.) Aug.–Sept.—Stems terete, grow-

ing in tufts, 2–3 feet high. Leaves 4–6 inches long, or often shorter, 4 to 5 lines wide, pale, rather membranaceous, cohering to the paper in the process of drying, on account of the numerous resinous globules intermixed with the close pubescence. Heads rather small, very numerous. Involucre short. Style moderately exserted.—This very distinct and apparently very local species was discovered in the year 1833, by one of the authors of this work, in the pine barrens of New Jersey, where it occurred abundantly, but we have never received it from any other quarter. In the Banksian herbarium, however, there is a specimen from Bartram, said to have been collected in Pennsylvania. In habit it resembles E. leucolepis; but the leaves are rather flaccid, and clothed with a very soft pubescence, and the involucre is different.

† † † Leaves on slender petioles: heads 12–15-flowered.

19. *E. serotinum* (Michx.): stem pulverulent-pubescent, much branched above; leaves opposite, the upper frequently alternate, on slender petioles, ovate-lanceolate, tapering above, acute, tripli-nerved and veiny, pubescent or nearly glabrous, coarsely and sharply serrate; corymbs numerous, compound; heads 12–15-flowered; scales of the involucre 10–12, linear-oblong, with scarious margins, very pubescent, imbricated; achenia glabrous, seldom glandular.—*Michx.! fl.* 2. *p.* 100; *Ell.! sk.* 2. *p.* 304; *DC.! prodr.* 5. *p.* 175.

Damp soil, N. Carolina! to Georgia! and Illinois! to Arkansas! and Louisiana! Sept.–Oct.—Stem 5–6 feet high, usually diffusely and somewhat paniculately branched above; the branches either opposite or alternate. Leaves 5–6 inches long; the lower ones narrowly ovate, with numerous coarse often irregular teeth; those of the branches often with few unequal teeth towards the base. Heads very numerous, rather small. Pappus about the length of the corolla.

§ 4. *Heads* 8–30*-flowered: scales of the campanulate involucre* 8–20, *nearly equal and in a single series: herbaceous: leaves opposite or rarely alternate, ovate, petioled, not punctate or sprinkled with resinous globules: achenia not glandular: flowers white or purple.*

20. *E. ageratoides* (Linn. f.): glabrous; stem branching; leaves opposite, on long petioles, broadly ovate, sometimes slightly cordate, acuminate, tripli-nerved, membranaceous, coarsely and sharply serrate; corymbs compound; heads 12–20-flowered; scales of the involucre 12–14, equal, in a single series, narrowly lanceolate, scarious and rather obtuse at the tips, slightly pubescent and ciliate; corolla narrowed below, campanulate at the summit, longer than the pappus; achenia glabrous.—*Linn. f.! suppl. p.* 355; *Willd.! spec.* 3. *p.* 1765; *Pursh! fl.* 2. *p.* 516; *Ell. sk.* 2. *p.* 303: *Bigel. fl. Bost. ed.* 2. *p.* 298; *Hook. fl. Bor.-Am.* 1. *p.* 305: *Darlingt. fl. Cest. p.* 451; *DC.! prodr.* 5. *p.* 175. E. urticæfolium, *Reich. syst.* 3. *p.* 719; *Michx.! fl.* 2. *p.* 100; not of *Linn. f. & Smith.* E. ceanothifolium, *DC. l. c.?* E. caule erecto, &c. *Linn.! hort. Cliff. p.* 396. Ageratum altissimum, *Linn.! spec.* 2. *p.* 839.

Moist rich woodlands and thickets, Canada! & Upper Missouri! to Georgia! and Louisiana! common, particularly in the Northern States. Aug.–Sept.—Stem 2–3 feet high; the summit and branches a little pubescent. Leaves usually large, 4–6 inches long, glabrous or with a few minute scattered hairs, mostly dilated and obtuse or truncate at the base, sometimes abruptly tapering into the petiole; the latter 1 to 2 inches in length. Flowers pure white, very numerous, exhaling a somewhat unpleasant odor. Lobes of the corolla ovate, glabrous. Style much exserted.

21. *E. aromaticum* (Linn.): pulverulent-pubescent or somewhat glabrous; stem simple or loosely corymbose at the summit; leaves opposite, on short petioles, or sometimes almost sessile, ovate, subcordate, or ovate-oblong, rather acute or obtuse, rarely acuminate, 3-nerved or tripli-nerved, of a thickish and firm texture, mostly scabrous-pubescent, rather obtusely dentate-serrate; corymbs loose, somewhat panicled; heads 8–20- (commonly 12–15-) flowered; scales of the involucre 10–14, linear-lanceolate, nearly equal, pubescent, with slightly scarious and obtuse tips; corolla narrowed below, campanulate at the summit, rather exceeding the pappus; achenia glabrous.—*Linn.! spec.* 2. *p.* 839 (fide *herb.!* & syn. *Pluk.! & Gronov.!*); *Willd.! spec.* 3. *p.* 1765; *Michx.! fl.* 2. *p.* 100; *Pursh! fl.* 2. *p.* 516; *Ait.! Kew.* (*ed.* 2.) 4. *p.* 508; *Ell.! sk.* 2. *p.* 304; *Bigel. fl. Bost. ed.* 2. *p.* 298; *Darlingt.! fl. Cest. p.* 452; *DC.! prodr.* 5. *p.* 175. E. cordatum, *Walt. Car. p.* 199; *DC.! l. c.* (the smaller-leaved forms.) E. melissoides, *Willd.! l. c. p.* 1754. (a dwarf form; heads about 8–flowered!) E. ceanothifolium, *Muhl. in Willd.! spec. l. c.* (fide *herb. Willd.*; but the heads at least 12-flowered, instead of 5-flowered); *Ell.! l. c.* (leaves small, petioled; heads 8–10-flowered!); *DC.! l. c.* (leaves larger, acuminate, nearly glabrous!) E. cordiforme & E. Fraseri, *Poir. suppl.* fide *DC.* (Eupatorium, *Lam. ill. t.* 672.)

Dry woods and usually in barren soil, from Massachusetts near the coast! to Florida! Alabama! and Louisiana! Aug.–Sept.—This species exhibits considerable variety in the form of the leaves, the length of the petioles, &c. It bears much resemblance to the preceding, and occasionally approaches it perhaps too closely; but it is a lower and more slender plant, with smaller and much firmer leaves on shorter petioles, fewer heads, but usually larger flowers. The root is perennial.

22. *E. ageratifolium* (DC.): shrubby, glabrous; the branches terete; leaves opposite, petioled, broadly ovate, somewhat truncate at the base, attenuate at the apex, obtuse, coarsely toothed, 3-nerved, not glandular; corymbs terminal, trichotomous; pedicels somewhat viscous, scarcely pubescent; heads about 10-flowered; scales of the involucre in a double series, linear, rather acute, slightly ciliate at the apex, at length spreading; pappus as long as the corolla; achenia puberulent, the angles somewhat scabrous. *DC.! prodr.* 5. *p.* 173.

β. Texense: branches, pedicels, petioles, and usually the veins of the leaves minutely puberulent; heads about 12-flowered.

Limestone rocks, Sabina's Creek (Camancheries) Texas, *Dr. Riddell!* (*β.*)—Shrub 6 feet high; the branches terete; the branchlets slightly angled. Leaves in shape and texture wholly resembling many forms of E. aromaticum; the corymbs also similar. Involucre about half the length of the flowers, glabrous or nearly so; the exterior scales 4–6, linear, rather acute, one of them shorter and bracteolate; the inner about the same number, rather broader, with narrow scarious margins, somewhat obtuse, scarcely ciliate at the apex. Corolla "white, slightly tinged with rose-color" (*Riddell*), dilated upwards, scarcely longer than the pappus; the teeth short, glabrous. Achenia puberulent, and appearing somewhat viscous.—The Texan plant accords almost exactly with De la Sagra's specimens from Cuba, except that the scales of the involucre are less ciliate and more obtuse.

23. *E. incarnatum* (Walt.): stem pulverulent-pubescent, branching; leaves opposite, on slender petioles, membranaceous, deltoid, truncate or subcordate (rarely only obtuse) at the base, tapering at the summit or acuminate, obtusely and coarsely toothed, 3-nerved at the base, slightly pubescent; corymb small, often panicled; heads 20-flowered; scales of the involucre 15–20, nearly equal, (a few of the outermost shorter,) in a somewhat double

series, subulate-linear, acute, 2-nerved, slightly pubescent; pappus about the length of the infundibuliform-tubular corolla; achenia glabrous.—*Walt. Car. p.* 200; *Ell.! sk.* 2. *p.* 306; *DC.! prodr.* 5. *p.* 175.

Rich soil, S. Carolina! to Florida! Louisiana! and Texas! Sept.–Nov. —Stem 2–3 feet high, at length decumbent and producing numerous branches. Leaves 1–2 inches long, the lateral nerves pedately branched from the base; petioles rather shorter than the lamina. Heads nearly as large as in E. ageratoides. Lobes of the corolla light purple, very short, ovate, obtuse, glabrous. Branches of the slightly exserted style very obtuse.—Considerably resembles Conoclinium cœlestinum.

24. *E. occidentale* (Hook.): nearly glabrous; stem (or branches) slender; leaves alternate (rarely opposite), on short petioles, ovate, acute or acuminate, tripli-nerved, coarsely and sparingly serrate; the uppermost narrow, entire; corymbs small and mostly simple, panicled; heads 15–25-flowered; scales of the involucre linear, acute, nearly equal, in a single series; corolla infundibuliform; achenia slender, glabrous.—*Hook.! fl. Bor.-Am.* 1. *p.* 305; *DC.! prodr.* 5. *p.* 176. E. Oreganum, *Nutt. in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 286.

Interior of Oregon, in stony places, *Douglas! Nuttall!*—Plant 6–12 inches high. Flowers white or pale rose-color. Styles much exserted. Leaves about an inch long.

Eupatorium luteum of Rafinesque doubtless belongs to some other genus; but it will never be identified by the following character: "*E. luteum* (yellow Eupatory); leaves linear, cuneiform, acute, entire, smooth; flowers paniculated; calyx 4-flowered.—In New Jersey." *Raf. in med. repos.* (*hex.* 2.) 5. *p.* 361.—*E. crassifolium* and *E. violaceum* are Rafinesquian species of the Florula Ludoviciana: the latter may be E. incarnatum, *Walt.*

Eupatorium Perrinianum of Sprengel, and of Schlechtendal (in *Linnæa*, 11. *p.* 5), which came from the West Indies, and not from South America as Sprengel states, is a genuine species of Vernonia, (fide. sp. authen. in *herb. Torr.*]: Prof. Schlechtendal must have overlooked the double pappus.

17. MIKANIA. *Willd. spec.* 3. *p.* 1452; *DC. prodr.* 5. *p.* 187.

Heads mostly 4-flowered. Receptacle naked, narrow. Scales of the involucre 4 or 5. Corolla dilated or campanulate at the summit, 5-toothed. Anthers partly exserted. (Style with a cylindrical glabrous bulb at the base; the branches exserted, filiform, scarcely obtuse.) Achenia angled. Pappus in a single series, capillary, scabrous.—Shrubby or herbaceous mostly climbing plants (chiefly tropical and American), with opposite commonly cordate leaves. Heads corymbose, panicled, or spicate. Flowers whitish.

1. *M. scandens* (Willd.): stem glabrous, twining; leaves on slender petioles, cordate, acuminate, repandly crenate or angularly toothed towards the base, membranaceous, slightly scabrous or pubescent, or glabrous; corymbs paniculate, clustered; scales of the involucre lanceolate; achenia minutely glandular.—*Willd. spec.* 3. *p.* 1743; *Pursh! fl.* 2. *p.* 517; *Ell. sk.* 2. *p.* 292; *Bigel. fl. Bost. ed.* 3. *p.* 314; *Darlingt. fl. Cest. p.* 454. Eupatorium scandens, *Linn.*; *Michx.! fl.* 2. *p.* 97; *Jacq. ic. rar. t.* 169.

β. pubescens: stem and leaves more or less pubescent.—M. pubescens, *Muhl. cat. p.* 71; *Nutt. gen.* 2. *p.* 136; *Ell. l. c.*; *DC.! l. c.*, & 7. (*mant.*) *p.* 271. Eupatorium scandens, *Linn.!* (as to specimen in his herb.); *Walt. Car. p.* 198.

Moist shady places, and along streams, Massachusetts! to Louisiana! common; the more pubescent forms occurring in the Southern States. July–Sept.—Flowers purplish-white or flesh-color. Anthers appendiculate at the apex.

18. CONOCLINIUM. *DC. prodr.* 5. *p.* 134.

Heads many-flowered. Involucre campanulate; the scales linear or subulate, somewhat imbricated in 2–3 series, nearly equal. Receptacle naked, conical! Corolla tubular-infundibuliform, 5-toothed at the summit. Anthers included. Branches of the style somewhat cylindrical, obtuse. Achenia angled, glabrous. Pappus capillary, scabrous, in a single series.—Perennial herbs or suffruticose (American) plants, with opposite petioled toothed leaves. Corymbs terminal, crowded. Flowers blue or purple.

1. *C. cœlestinum* (DC.! l. c.): herbaceous, pubescent or nearly glabrous; leaves deltoid-ovate, often slightly cordate, tapering to the apex, coarsely crenate-serrate, tripli-nerved, on slender petioles; scales of the (30–60-flowered) involucre about 30, nearly subulate.—Eupatorium cœlestinum, *Linn. spec.* 2. *p.* 838; *Willd.! spec.* 3. *p.* 1764; *Michx.! fl.* 2. *p.* 100; *Ell. sk.* 2. *p.* 306; *Darlingt.! fl. Cest. p.* 462. Cœlestina cærulea, *Spreng. syst.* 3. *p.* 446; *Beck! bot. p.* 198; *Hook.! compan. to bot. mag. p.* 96; not of *Cass., Less. &c.*

Thickets &c. Pennsylvania, and throughout the Western and Southern States! Sept.—Stem 2–3 feet high, sometimes hairy. Flowers light bluish-purple, fragrant. Achenia dotted with resinous globules.—The genus is distinguished from Eupatorium merely by the conical receptacle.

Subtribe 2. TUSSILAGINEÆ, *Less.*—Heads with the flowers dissimilar or somewhat dicœcious (white, purplish, or sometimes yellow); the pistillate either ligulate or tubular.

19. NARDOSMIA. *Cass. dict.* 35. *p.* 186; *Less. syn. p.* 139.

Heads many-flowered, somewhat dicœcious. STERILE PL. Flowers of the ray in a single series, pistillate, ligulate; of the disk numerous, perfect but infertile, with the corolla tubular and 5-toothed. FERTILE PL. Flowers of the ray in several series, pistillate, minutely ligulate; those of the disk few, tubular. Scales of the involucre in a single series, equal to or shorter than the flowers. Receptacle flat, naked. Achenia somewhat terete, glabrous. Pappus capillary, that of the sterile plant shorter and less copious than of the fertile.—Perennial herbs (in N. America nearly confined to the northern regions). Leaves radical, cordate, toothed or lobed, petioled, appearing with or rather later than the flowers. Scape with scaly bracts; the heads in a fastigiate thyrsus or corymb. Flowers purplish or nearly white, fragrant.

1. *N. frigida* (Hook.): leaves cordate, unequally coarsely and obtusely toothed, and somewhat lobed, glabrous above, the lower surface white and

tomentose; the lobes at the base diverging. *DC.—Hook.! fl. Bor.-Am.* 1. *p.* 307 (excl. *β.*?); *DC. prodr.* 5. *p.* 205. N. angulosa, *Cass. dict. l. c.*; *Less. in Linnæa*, 6. *p.* 107. Tussilago frigida, *Linn.*; *Fl. Dan. t.* 61; *Pursh, fl.* 2. *p.* 531. T. scapo imbricato, &c. *Gmel. fl. Sibir.* 2. *p.* 150, *t.* 70.

Arctic America, from lat. 66°, *Richardson!* Kotzebue's Sound! and Unalaschka! to Lake Winipeg, lat. 52°, the mountains of Canada, and the highest mountains of Vermont and New Hampshire, according to *Pursh.*

2. *N. corymbosa* (Hook.): leaves cordate, sinuate and acutely denticulate, oblong, acute, glabrous above, tomentose beneath; the lobes at the base diverging. *DC.—Hook.! l. c.*; *DC. prodr.* 5. *p.* 206. Tussilago corymbosa, *R. Br.! in Parry's 1st voy. suppl. p.* 269; *Hook. & Arn ! bot. Beechey, p.* 126.

Arctic America, from Melville Island! to Kotzebue's Sound! and south to Fort Norman, in about lat. 65°.—Corymb with few heads.

3. *N. sagittata* (Hook.): leaves oblong, acute, sagittate, entire; the lobes obtuse, *DC.* (leaves cordate or reniform-sagittate, sinuate-toothed, tomentose beneath. *Hook.! l. c.*—Tussilago sagittata, *Pursh, fl.* 2. *p.* 332.

Hudson's Bay (*Hutchinson*), *Pursh.* Swamps in the Rocky Mountains (*Drummond!*) and from Lake Superior in lat. 48°, to Fort Franklin in lat. 66°, *Richardson.*—With numerous specimens before us, we strongly suspect (as Hooker also does) that this and the two preceding are in reality one species. Hooker's N. sagittata has deeply toothed leaves, which are sometimes reniform. Can it be the same as Pursh's plant with "foliis integerrimis"?

4. *N. palmata* (Hook.): leaves reniform or roundish-cordate, tomentose beneath, palmately 5–7-lobed; the segments coarsely toothed, often incised or somewhat lobed.—*Hook.! fl. Bor.-Am.* 1. *p.* 308; *DC. l. c.* N. palmata, Hookeriana, & speciosa, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 288. Tussilago palmata, *Ait. Kew.* (*ed.* 1) 3. *p.* 188, *t.* 2; *Willd.! spec.* 3. *p.* 1972; *Pursh! fl.* 2. *p.* 531; *Beck, bot. p.* 199.

Swamps and shady banks of streams, Newfoundland & Labrador! and from Bear Lake, lat. 67°, to the Rocky Mountains! and to the Pacific at the mouth of the Oregon! Also Lake Huron and Maine, *Nuttall.* Fairhaven, Vermont, *Mr. Robbins! Prof. Beck.* Sunderland, Massachusetts, *Prof. Hitchcock!* Saratoga, New York, *Dr. Steele!* April–May.—Leaves sometimes 10 to 12 inches in diameter, when fully developed. Scape stout, 6–20 inches high, with numerous leaf-sheaths. Heads numerous, in a corymbose thyrsus.—Some specimens from the Rocky Mountains are noticed by Hooker, which, if they really belong to this species, approach the preceding perhaps too closely. Mr. Nuttall's N. Hookeriana is said to be founded upon the N. palmata of Hooker, as well as of Willdenow, Pursh in part, and De Candolle. His N. speciosa is the N. palmata of Hooker from Oregon: the specimens accord so well with the figure of Aiton, and with the plant of the Northern United States, &c. (which presents very considerable diversities in size and foliage) that we see not how it is to be distinguished. Although the species of this genus are by no means well settled, it is evident that little dependence can be placed on the degree of division or toothing of the leaves. The *subfeminine* and *masculine* plants are different in appearance.

20. TUSSILAGO. *Tourn.*; *Gærtn. fr. t.* 170; *Less. syn. p.* 159.

Heads many-flowered, heterogamous. Flowers of the ray very narrowly ligulate, in several series, pistillate; those of the disk few, tubular (the limb

of the corolla campanulate, 5-toothed), staminate. Scales of the involucre oblong, obtuse, somewhat in a single series. Receptacle naked. Anthers scarcely caudate. Style abortive in the flowers of the disk; in those of the ray 2-cleft, the branches somewhat terete. Achenia of the ray somewhat cylindrical-oblong, glabrous; in the disk abortive. Pappus of the ray-flowers in many series, of the disk in a single series, capillary.—A perennial herb, common throughout Europe and Asia, and sparingly naturalized in the northern portions of the United States. Rhizoma rather thick, horizontal. Leaves radical, appearing later than the flowers, cordate, angled or toothed, petioled. Scape clothed with scaly bracts, tomentose, bearing a single head. Flowers yellow.—*Colt's-foot.*

T. Farfara (Linn.)—*Fl. Dan. t.* 595; *Engl. bot. t.* 429; *Willd.! spec.* 3. *p.* 1967; *DC.! prodr.* 5. *p.* 208; *Beck, bot. p.* 200.

Wet places and low meadows in cultivated grounds; introduced from Europe. March–April.—The *Colt's-foot*, a well known article of the popular materia medica, although not enumerated by any American writer, except Prof. Beck, is perfectly naturalized in many parts of the Northern States, in moist grounds; where it sometimes becomes a troublesome weed.

21. ADENOCAULON. *Hook. bot. misc.* 1. *p.* 19, *t.* 15, & *fl. Bor.-Am.* 1. *p.* 308; *DC. prodr.* 5. *p.* 207.

Heads 5–10-flowered, heterogamous; the flowers all tubular and equal: those of the ray 5, in a single series, pistillate; of the disk 4–5, staminate. Corolla 4–5-lobed. Scales of the involucre several, in a single series, reflexed in fruit. Receptacle naked. Achenia obovate-oblong or clavate, bearing towards the summit numerous large stipitate glands. Pappus none.—Perennial (N. American & Chilian) herbs. Stem leafy towards the base, naked and paniculate above, clothed with a somewhat deciduous tomentose pubescence, glandular towards the summit. Leaves alternate, pinnately or palmately veined, membranaceous, petioled, glabrous above, tomentose and canescent beneath. Heads few, small, loosely paniculate. Flowers apparently white.

1. *A. bicolor* (Hook.! l. c.): leaves deltoid, mostly cordate, angularly toothed or sinuate, somewhat decurrent on the petiole.—*DC. prodr.* 5. *p.* 207.

β. *integrifolium*: leaves smaller, deltoid-ovate or slightly cordate, obscurely angulate-toothed or entire.—A. integrifolium, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 289.

Dense woods, Oregon, from Fort Vancouver, &c. *Dr. Scouler! Nuttall!* to the Rocky Mountains in lat. 52°, *Drummond!* Near the outlet of Lake Superior, *Dr. Pitcher!* June.—Stem 10–30 inches high, slender. Leaves 2–4 inches long, and usually about the same breadth at the base, densely tomentose beneath with a close white arachnoid pubescence. Anthers sagittate, acuminate, sterile and nearly unconnected in the fertile flowers. Style entire in the sterile flowers, in the fertile with two short obtuse lobes.—The var. β. appears to pass insensibly into the ordinary larger form; the toothing of the leaves is very inconstant.

TRIBE III. ASTEROIDEÆ. *Less.*

Heads heterogamous or sometimes homogamous, rarely diœcious. Style (in the perfect flowers) cylindraceous above; the branches flat or flattish, mostly linear or lanceolate, above equally pubescent externally; the conspicuous stigmatic lines terminating where the exterior pubescence commences, not confluent.—Leaves alternate, or rarely opposite.

CONSPECTUS OF THE SUBTRIBES.

Subtribe 1. ASTERINEÆ. Heads heterogamous and radiate, or homogamous. Receptacle seldom chaffy. Anthers not caudate. Leaves alternate. 95

95 Div. 1. ASTEREÆ. Heads radiate, heterochromous (rays never yellow).

190 Div. 2. CHRYSOCOMEÆ. Heads radiate, or homogamous, homochromous (both the ray and disk yellow).

Subtribe 2. BACCHARIDEÆ. Heads diœcious or heterogamous, but never radiate; the pistillate flowers tubular, slender or filiform, in several series. Receptacle not chaffy. Anthers not caudate. 257

Subtribe 3. TARCHONANTHEÆ. Heads diœcious or heterogamous, but never radiate; the pistillate flowers tubular and very slender, mostly in several series. Anthers caudate.

Subtribe 4. INULEÆ. Heads heterogamous and radiate, or homogamous and discoid, never diœcious. Receptacle not chaffy. Anthers caudate. Leaves alternate. 267

Subtribe 5. ECLYPTEÆ. Heads heterogamous, radiate. Receptacle chaffy. Anthers not caudate. Pappus toothed or awned, or none. Leaves opposite. 267

Subtribe 1. ASTERINEÆ, *DC.*—Heads heterogamous and radiate, or homogamous, never diœcious. Receptacle seldom chaffy. Anthers not caudate. Leaves almost always alternate.

Div. 1. ASTEREÆ, *DC.*—Heads heterogamous, radiate; the rays of the cyanic series (viz: white, purple, or blue, &c.); the disk-flowers yellow, but frequently changing to purple in fading. Receptacle not chaffy, except in a species of Corethrogyne.

CONSPECTUS OF THE GENERA.

Subdiv. 1. EUASTEREÆ.—Pappus of capillary or rarely subulate bristles. 96

* *Rays neutral or sterile. Pappus simple, capillary.*

22. GALATELLA. Appendages of the style triangular or deltoid-spatulate. Pappus of the ray and disk similar.

23. CORETHROGYNE. Appendages of the style densely penicillate. Pappus of the ray nearly or entirely wanting.

* * *Rays fertile. Pappus of the ray and disk similar* (*except in* Erigeron § Phalacroloma), *simple or double; the inner capillary.*

24. DIETERIA. Pappus simple, very unequal. Rays several or numerous, in a single series. Involucre obovate, much imbricated. Root mostly biennial. Leaves usually pinnately toothed or pinnatifid.

25. SERICOCARPUS. Pappus simple, unequal. Flowers of the ray and disk few. Involucre oblong, imbricated, cartilaginous.

26. ASTER. Pappus simple, copious. Rays numerous, in a single series. Involucre more or less imbricated. Receptacle alveolate.

27. ERIGERON. Pappus either simple (not copious), or double; the exterior setaceous-subulate or squamellate. Rays very numerous, and often in two or more series. Scales of the involucre nearly equal, almost in a single series. Receptacle naked.

28. DIPLOPAPPUS. Pappus double; the exterior short and setaceous or squamellate-subulate. Rays in a single series. Involucre imbricated.

* * * *Pappus of the ray and disk dissimilar.*

29. TOWNSENDIA. Pappus simple; that of the disk composed of subulate-capillary bristles; of the ray short and subulate. Achenia compressed.

30. CHÆTOPAPPA. Pappus double; the inner of 5 rigid bristles; the exterior of 1 to 5 hyaline scales. Achenia nearly terete.

31. BOLTONIA. Pappus of several very small, and 2 or more rigid and subulate larger bristles. Achenia flat, margined.

Subdiv. 2. BELLIDEÆ.—Pappus none, or minute and coroniform.

32. BELLIS. Achenia obovate, compressed. Pappus none.

33. APHANOSTEPHUS. Achenia terete. Pappus a very minute crown.

Subdiv. 1. EUASTEREÆ.—Pappus, at least the inner, composed of capillary or rarely subulate bristles. (Euastereæ, Diplopappeæ, Erigereæ, & Heteropappeæ, *DC.*)

22. GALATELLA. *Cass. dict.* 37. *p.* 463; *Nees, Ast. p.* 158. (excl. spec.)

Galatea, *Cass.* (*dict.* 18, *&c.*); *Less.*

Heads many-flowered; the ray-flowers few (3–12), sterile, but usually furnished with a rudimentary style, and sometimes with one or two abortive filaments; those of the disk tubular, perfect. Involucre shorter than the disk; the scales closely imbricated in 3 or 4 series, sometimes obscurely 1–3-nerved or slightly carinate, destitute of herbaceous tips; the outermost bracteolate. Receptacle alveolate, the alveoli toothed. Corolla of the disk with a cylindrical tube, and an expanded deeply 5-cleft limb; the lobes lanceolate-linear, spreading. Anthers exserted. Branches of the style (in the disk-flowers) linear, terminated by a short and broad deltoid-spatulate or triangular appendage. Achenia oblong or slightly cuneiform, somewhat compressed, silky-villous. Pappus composed of copious rather rigid unequal serrulate-scabrous capillary bristles; that of the ray similar but rather shorter.—Perennial herbs (natives of Europe, Northern Asia, and the United States); the stems simple below, corymbose at the summit. Leaves alternate, lanceolate or linear, entire, rather rigid, 1–3 nerved, veinless, often impressed-punctate. Heads terminating the fastigiate branches. Rays blue, purple, or nearly white; the disk-flowers yellow, sometimes changing to purplish.

Galatella scarcely differs from Linosyris except by the presence of (white or blue) rays; and these, according to Ledebour, are sometimes wanting in G. dracunculoi-

des: the two genera have also nearly the same geographical range. The sterile rays chiefly distinguish it from Aster § ? Orthomeris (species of Calimeris of authors); to which Aster nemoralis, *Ait.* belongs.

1. *G. hyssopifolia* (Nees): nearly glabrous, minutely scabrous; the corymbose branches numerous and crowded; leaves lanceolate-linear, acute, narrowed at the base, punctate, 3-nerved; those of the branches small, subulate-linear; involucre about half the length of the disk; the scales acutish; the exterior ovate-lanceolate, rather fleshy; the interior larger, linear-oblong, with membranaceous margins; rays 5–10, longer than the disk.—*Nees, Ast. p.* 160; *DC.! prodr.* 5. *p.* 255. G. albiflora, *Cass. dict.* 18. *p.* 58. (under Galatea.) Aster hyssopifolia, *Linn.! mant. p.* 114; *Willd.! spec.* 3. *p.* 2022; *Pursh! fl.* 2. *p.* 543; *Ell.! sk.* 2. *p.* 342.

β. ? leaves mostly 1-nerved; rays 3–7, not exceeding the disk.—G. linifolia, *Nees, l. c.*; *DC.! l. c.* (excl. syn. *Linn.*) G. albiflora, *Cass. in dict. sci. nat.* 18. *p.* 58, fide *Nees.* Chrysopsis linifolia, *Nutt. gen.* 2. *p.* 152.

"Sandy fields and woods, New Jersey to Carolina," *Pursh!* Aug.–Oct. —Stem 1–2 feet high, strict. Leaves 1–3 inches long, spreading, 1-nerved, and often with two less distinct lateral nerves. Rays white, tinged with purple.—This is a very uncommon plant, if indeed it be a native of the United States. We have never met with an indigenous specimen, unless that in Elliott's herbarium, communicated by Muhlenberg, should prove to be so. Nees, however, professes to have seen not only spontaneous specimens of his G. linifolia (which appears to differ from G. hyssopifolia merely in its short rays), but even to have met with New Jersey specimens of G. dracunculoides. His G. leptophylla, an impunctate species of unknown origin, is also conjectured to be a native of North America. The species of Galatella are still in much confusion.

23. CORETHROGYNE. *DC. prodr.* 5. *p.* 215.

Heads many-flowered; the ray-flowers neutral, numerous, in a single series; those of the disk tubular, perfect. Scales of the hemispherical involucre imbricated in several series, lanceolate or linear, with somewhat spreading tips; the exterior shorter. Receptacle flat, obscurely alveolate, sometimes with linear chaff scattered among the flowers. Rays linear, elongated; the corolla of the disk cylindraceous, with 5 short (somewhat hairy) teeth. Anthers tipped with a filiform-cuspidate appendage. Branches of the style linear, bordered with conspicuous stigmatic lines, tipped with a dense penicillate tuft of rather rigid bristles. Achenia of the ray none, or a mere rudiment; of the disk cuneiform or turbinate, silky or villous. Pappus simple, of numerous rather rigid scabrous unequal bristles; that of the ray obsolete, or of few short and unequal bristles.—Perennial herbs or suffrutescent plants (natives of California), clothed with a soft and white, at length somewhat deciduous wool; the branches terminated by rather large solitary heads. Leaves numerous, linear-lanceolate or oblanceolate, mucronulate, closely sessile; the radical and lowermost tapering into a petiole, serrate or toothed towards the apex. Rays violet-purple; the disk yellow. Pappus turning reddish-brown or purplish.

To this interesting genus (founded upon a Californian plant collected by Douglas) we had referred, from their description, the Aster ? filaginifolius and A. ? tomentellus of Hooker & Arnott in Beechey's Voyage. Some time afterwards, finding two species in the collection of Mr. Nuttall, upon which he had established a new

genus (*Heterostephium*) in a memoir read before the American Philosophical Society, we informed him that they belonged in our opinion to Corethrógyne, notwithstanding the want of chaff upon the receptacle, and that they were the two doubtful Asters of Hooker and Arnott, mentioned above, and one of them probably the C. Californica of De Candolle. Mr. Nuttall published them accordingly as species of Corethrogyne, one under the name of C. incana (supposing it to be the Diplopappus incanus, *Lindl.*), the other as C. filaginifolia. Having since had the opportunity of comparing original specimens of all these plants, our opinion, as regards the genus, is fully confirmed: so perfect, indeed, is the resemblance between the C. incana, *Nutt.* and C. Californica (excepting the chaff of the latter), that we still strongly suspect they will prove to be the same species. The A.? tomentellus, *Hook. & Arn.* is however a different species, perhaps too near C. filaginifolia.

§ 1. *Receptacle with linear membranaceous chaffy scales intermixed among the flowers, usually, if not always, wanting in the centre of the head.*

1. *C. Californica* (DC.): stems and simple branches very woolly, leafy; leaves linear-lanceolate, suberect; the lower ones lanceolate-oblong, tapering to the base, sparingly toothed; scales of the hemispherical involucre glandular-viscid, with somewhat spreading tips; achenia densely silky-villous.—*DC.! l. c.; Hook. & Arn.! bot. Beechey, suppl. p.* 350.

California, *Douglas!*—Leaves an inch or more in length, acute, woolly like the stem, resembling a Gnaphalium. Heads broad, three-fourths of an inch in diameter. Scales of the involucre rigid; the innermost linear, as long as the disk, scarious below; the exterior shorter, entirely herbaceous and glandular-viscid externally, and also slightly woolly: the summit of the branches likewise slightly glandular. Chaff of the receptacle narrow, scarious, sometimes as long as the flowers and with herbaceous tips, but some of them reduced to hyaline scales not more than twice the length of the achenia. The achenia are densely clothed with very white and silky villous hairs, which project beyond the summit, so as to appear like a short exterior pappus: bristles of the pappus unequal in size and length: the achenia of the ray an abortive rudiment, with a pappus few or several, short, and very unequal bristles, some of the stronger almost subulate.

§ 2. *Receptacle destitute of chaff.*

2. *C. incana* (Nutt.): very woolly; stem very leafy, branching above; the branches bearing 1 to 3 heads; leaves linear-lanceolate, suberect; the lowermost oblong-lanceolate, tapering to the base, sparingly toothed; scales of the hemispherical involucre glandular-viscid, with somewhat spreading tips; the exterior tomentose; achenia silky-canescent.—*Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 290, excl. syn.

St. Diego, California, *Nuttall!* May.—The ray-flowers (light bluish-purple, *Nutt.*) present scarcely a trace of an ovary, and a rudimentary pappus of only 3 or 4 very short bristles; the fertile achenia are clothed with a rather shorter pubescence; the tuft of bristly hairs which crowns the branches of the style is not so strong as in the preceding species; and there are no chaffy scales on the receptacle: otherwise the two plants appear exactly alike. It is said to exhale the heavy aromatic odor of some species of Gnaphalium.—The Diplopappus incanus, *Lindl.*, referred here by Nuttall, is a species of Dieteria.

3. *C. filaginifolia* (Nutt.): clothed with a loose somewhat floccose and deciduous wool; branches slender, rather naked above; lower leaves oblong-spatulate or oblanceolate, very sharply or incisely serrate towards the apex, tapering into a short petiole; those of the branchlets lanceolate, sessile, often entire, scattered; scales of the somewhat obovoid involucre imbricated in 3 or 4 series, acute, somewhat appressed, membranaceous, not glandular, at

first woolly-canescent, at length nearly glabrous; achenia cuneiform-oblong, compressed; silky-pubescent.—*Nutt.! l. c.* Aster? filaginifolius, *Hook. & Arn.! bot. Beechey, p.* 146. Diplopappus leucophyllus, *Lindl. in DC. prodr.* 5. *p.* 278?

Monterey, California, *Capt. Beechey!* St. Barbara, *Nuttall!*—Plant more slender and branched than the preceding, apparently slightly suffruticose at the base; the pubescence similar, but looser and more deciduous. Heads smaller; the scales of the involucre fewer, and not glandular or viscid. Pappus of the ray almost none. Young achenia turbinate and silky-canescent; when mature compressed and minutely silky-pubescent. The style resembles that of the preceding species.

4. *C. tomentella:* stem shrubby at the base; the branches slender, woolly, leafy to the summit; leaves (of the branches) appressed, linear or linear-oblong, closely sessile; those of the short branchlets or peduncles crowded, very small and bract-like, passing into the oblong obtuse tomentose scales of the somewhat turbinate involucre; achenia silky-canescent.—Aster? tomentellus, *Hook. & Arn.! bot. Beechey, p.* 146.

Monterey, California, *Capt. Beechey!* (v. sp. in *herb. Hook.*)—We have seen but a single and imperfect specimen, which has still smaller heads than C. filaginifolia: the oblong or slightly spatulate scales of the involucre are pretty closely imbricated in 4 or 5 series, and gradually pass into the very short bract-like leaves of the branchlets; they are somewhat membranaceous, obtuse, but often slightly mucronulate; the tips somewhat spreading. The leaves of the branches are small, densely woolly; the upper oblong; the lowest linear; those of the proper stem unknown.

24. DIETERIA. *Nutt. in trans. Amer. phil. soc.* 7. *p.* 300. (excl. spec.)

Heads many-flowered; the ray-flowers numerous (10–30), in a single series, pistillate; those of the disk tubular, perfect. Scales of the obovoid or turbinate involucre closely imbricated for the most part in several series, linear, rigid, somewhat carinate, unequal, with herbaceous squarrose-spreading or recurved tips. Receptacle flat, somewhat alveolate; the alveoli toothed or lacerate. Rays linear; the corolla of the disk cylindraceous, often narrow, 5-toothed. Appendages of the style filiform-subulate or linear-lanceolate, minutely hirsute. Achenia turbinate or cuneiform, often compressed, pubescent or silky. Pappus of numerous scabrous and rather rigid capillary bristles, very unequal (in 2 or 3 series); that of the ray similar but frequently shorter and less copious.—Annual, biennial, or triennial herbs (natives of arid or naked plains between the Mississippi and the Pacific), divaricately branched, canescent or pulverulent-pubescent, or sometimes viscid. Leaves rarely entire, usually pinnately toothed or pinnatifid, narrow; the cauline sessile. Heads (often large) solitary or several on the corymbose or racemose branches. Rays purple or violet, rarely ochroleucous; the disk-flowers yellow. Pappus tawny or brownish.

§ 1. *Scales of the involucre imbricated in several series, with short herbaceous tips: leaves usually rigid, spinulose-toothed or pinnatifid, sometimes entire; the cauline linear, the radical lanceolate or spatulate (rays pistillate, but sometimes infertile?).*—DIETERIA proper.

* *Corolla of the disk very narrow, not dilated at the summit: appendages of the style subulate-filiform.*

1. *D. sessiliflora* (Nutt.): viscidly pubescent; stems simple; heads spicate-racemose, often crowded; leaves linear or somewhat lanceolate, incisely spinulose-toothed; rays (12–15) ochroleucous.—*Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 301.

Denudated plains of the Rocky Mountains and Oregon, *Nuttall!*—Stems about a foot high, mostly simple, the base and lower leaves minutely canescent; the upper portion, involucre, &c. viscid. Heads rather smaller than the following, scarcely a third of an inch in diameter, obovate or turbinate, disposed in a close or crowded raceme or spike. Achenia, as in the other species of this division, narrow, canescently pubescent.—Very nearly allied to the following species.

2. *D. viscosa* (Nutt.): pulverulently pubescent and viscid; stems simple, racemosely branched or somewhat corymbose; leaves linear, acute or acuminate, incisely spinulose-toothed; rays (18–20) purple.—*Nutt.! l. c.*

With the preceding, particularly near Scott's Bluff on the Platte, *Nuttall!*—"Stem simple, often very viscid, and exhaling the strong heavy scent of Aster graveolens or Gnaphalium Americanum. Leaves sometimes nearly pinnatifid or runcinate." *Nutt.*—Scales of the turbinate involucre very numerous, linear, rigid, with short squarrose-recurved tips.

3. *D. divaricata* (Nutt.): minutely canescent, not glandular or viscid; stem racemose or racemose-compound; the branches divaricate; radical and lower leaves lanceolate or somewhat spatulate, strongly spinulose-toothed; the upper linear, small, often nearly entire; rays (12–16) short, pale blue or purple.—*Nutt.! l. c.*

Denudated plains of the Rocky Mountains and Oregon, common, *Nuttall!*—About a foot high; branches rather naked, with small leaves, spreading out into a compound corymb. Pappus fulvous or white. *Nutt.*—The heads are about the size of the preceding, apparently more broadly obovoid or almost hemispherical; with rather broader, fewer, and less acute, perhaps less rigid, canescently puberulent (but not glandular or viscid) scales. The rays, as in the preceding, are not much longer than the disk.—These species are so nearly related that they may hereafter be found to pass into each other.

4. *D. incana*: perennial? minutely canescent throughout with a very short soft pubescence; stem stout, racemosely branched; the branches often elongated and corymbose, terminated by single large heads; leaves linear, mucronulate, entire, or frequently with a few laciniate mucronate teeth near the base; involucre obovoid-hemispherical; the linear slightly glandular scales imbricated in numerous series, with very acute squarrose tips; rays (about 30) large, bright violet; achenia narrow, canescent.—Diplopappus incanus, *Lindl.! bot. reg. t.* 1693; *Hook.! bot. mag. t.* 3382; *DC.! prodr.* 5. *p.* 278.

California, *Douglas!* (probably from the interior.)—Stem stout, 1–2 feet high, apparently a little woody at the base: the branches simple or somewhat branched, ascending, racemose, becoming corymbose at the summit. Leaves 1–2 inches long, closely sessile or slightly clasping, about 2 lines wide; the lower obtuse, but mucronulate, often presenting 1 to 3 or 4 slender divaricate and mucronate teeth on each side near the base. Heads in the wild plant about two-thirds of an inch, in the cultivated nearly an inch, in diameter, without including the numerous and large broadly linear rays.—This is a genuine species of Mr. Nuttall's Dieteria, and the most showy of the genus. The late Mr. Douglas alone seems to have met with it. The cultivated specimens are less canescent, the branches more elonga-

ted, the heads larger, the involucre more hemispherical, with narrower and more squarrose scales.

* * *Appendages of the style subulate or somewhat lanceolate: pappus more slender.*

5. *D. canescens* (Nutt.): minutely canescent with a soft pubescence; stem low, much branched, corymbose; leaves linear, entire; the radical spatulate; scales of the obovoid involucre lanceolate, acute, imbricated in about 4 series, with slightly squarrose tips; rays (18–20) rather large, purplish-blue. —*Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 300. Aster canescens, *Pursh! fl.* 2. *p.* 547. A. biennis, *Nutt.! gen.* 2. *p.* 155.

Upper Missouri, in denudated argillaceous soils, from the Arikarees to Fort Mandan, *Nuttall!* (who alone has collected it.) Aug.–Oct.—Stem about a foot high, divaricately branched, fastigiate at the summit, bearing numerous heads about as large as a Daisy. Scales of the involucre rigid, canescent, with short greenish tips. Cauline leaves closely sessile, 1 to 2 inches long, 1 to 2 lines wide. Appendages of the style subulate-lanceolate.

6. *D. pulverulenta* (Nutt.): somewhat canescently puberulent; stem low, much branched from the base, the branches fastigiate, bearing few heads on rather naked branchlets; leaves linear or lanceolate; the lower sparingly toothed or spinulose-serrulate; the uppermost entire; scales of the hemispherical involucre lanceolate, acute, imbricated in about 3 series; rays (8–12) short, pale purple.—*Nutt.! l. c.*

Arid plains towards the sources of the Platte, *Nuttall!*—About 6 inches high. Nearly allied to the preceding; the heads smaller, the scales of the involucre less imbricated, somewhat viscid? Appendages of the style subulate.

§ 2. *Scales of the hemispherical involucre nearly equal, imbricated in about 3 series, linear, with a short appressed somewhat cartilaginous base, and elongated acute spreading herbaceous tips: receptacle obscurely alveolate: achenia obovate, many-striate: pappus of the ray and disk nearly equal: leaves not rigid, pinnatifid and bipinnatifid.*—PAPPOCHROMA, Nutt.

7. *D. coronopifolia* (Nutt.): pubescent and somewhat viscid, diffusely branched from the base; the branches mostly terminated by single (showy) heads; radical and lower leaves bipinnatifid, petioled; the upper pinnatifid, with the segments toothed or incised; rays (about 20) large, reddish-purple; achenia villous.—*Nutt.! l. c.* Chrysopsis (Pappochroma) coronopifolia, *Nutt.! in jour. acad. Philad.* 7. *p.* 34.

Dry naked places along streams, from the Upper Missouri and Platte to the Rocky Mountains, *Mr. Wyeth! Nuttall!* July–Aug.—Root annual or biennial? Stems 6–10 inches high. "Heads nearly as large as the garden Marigold." Scales of the involucre with long and loose herbaceous very acute summits. Appendages of the style subulate. Achenia large, compressed, but turgid, nearly as long as the pappus when mature. Pappus reddish-brown, copious, rather rigid; the bristles in 3 or more unequal series.

25. SERICOCARPUS. *Nees, Ast. p.* 148; *DC. prodr.* 5. *p.* 261.

Aster § Leucocoma, *Nutt.* (1834.)

Heads 12–15-flowered; the ray-flowers about 5, distant, pistillate; those of the disk tubular, perfect. Scales of the obovate-oblong or turbinate-cylindrical involucre closely imbricated in several series, nerveless or obscurely 1-nerved; the lower portion cartilaginous (whitish), appressed; the apex

herbaceous, often spreading or squarrose. Receptacle small, alveolate; the alveoli toothed or lacerate-ciliate. Rays oblong-linear; the corolla of the disk slightly expanded at the summit, 5-lobed; the lobes revolute, lanceolate, acute. Appendages of the style (in the disk flowers) lanceolate-subulate, minutely hispid, longer than the stigmatic portion. Achenia obpyramidal, short, densely silky. Pappus simple, composed of rather numerous and rigid unequal scabrous bristles, some of them thickened upwards.—Perennial (North American) herbs, corymbose at the summit; with alternate entire or serrate sessile leaves. Heads in crowded corymbs, sometimes fascicled or glomerate. Flowers of the ray white; those of the disk pale yellow, rarely changing to purplish.

§ 1. *Involucre about the length of the disk; the exterior scales oblong or oval, closely appressed, with rigid herbaceous squarrose tips.*

1. *S. conyzoides* (Nees): stem somewhat pubescent, slightly angled; leaves ciliate, glabrous beneath, veiny, obscurely 3-nerved; the upper ones oblong or lanceolate, often entire; the lowermost spatulate-oval, coarsely serrate towards the apex, tapering into a slender margined petiole; involucre somewhat turbinate; rays rather short; pappus ferruginous.—*Nees, Ast. p.* 150; *Darlingt.! fl. Cest. p.* 470; *DC.! prodr.* 5. *p.* 161. Conyza asteroides, *Linn.! spec.* 2. *p.* 861; *Walt.! Car. p.* 204. Aster conyzoides, *Willd. spec.* 3. *p.* 2043; *Pursh! fl.* 2. *p.* 555; *Ell.! sk.* 2. *p.* 341; *Nutt.! gen.* 2. *p.* 158 (& β. plantaginifolius); *Bigel. fl. Bost. ed.* 2. *p.* 311. A. Marilandicus (&c. *Pluk. mant.*), *Michx.! fl.* 2. *p.* 108. Solidago calycibus squarrosis, flosculis, &c., *Gronov.! fl. Virg.* (*ed.* 1) *p.* 97.

Dry woodlands, Massachusetts! to Florida! common. June–Aug.—Plant 1–2 feet high. Leaves rather firm, 1–3 inches long. Heads sometimes solitary and pedicellate, but usually sessile in small clusters. Rays much shorter than in the S. solidagineus, but always longer than the disk.

2. *S. solidagineus* (Nees): glabrous; stem angled with decurrent lines: leaves linear-oblanceolate, or linear, obtuse, tapering to the base, entire, with serrulate-scabrous margins, indistinctly 3-nerved or slightly veiny, obscurely punctate; heads (small) glomerate at the extremity of the fastigiate peduncles; involucre cylindraceous, few-flowered; rays elongated; pappus white.—*Nees, Ast. p.* 149; *Hook.! fl. Bor.-Am.* 2. *p.* 14; *Darlingt.! fl. Cest. p.* 470; *DC.! l. c.* Conyza linifolia, *Linn.! l. c.*; *Walt.! Car. p.* 204. Aster solidaginoides, *Michx. in Willd.! spec.* 3. *p.* 2024; *Pursh! fl.* 2. *p.* 543; *Nutt.! l. c.*; *Ell. l. c.* A. solidagineus, *Michx.! fl.* 2. *p.* 108. A. Americanus albus, &c., *Pluk. alm. t.* 79, *f.* 2. Galatella obtusifolia, *Lehm.! ind. sem. hort. Hamb.* 1837.

Moist woodlands, Canada! and Northern States! to Alabama! and Louisiana! not very common. July–Sept.—Plant pale yellowish-green, about 2 feet high; the stems slender, often several from the same root or woody caudex. Heads in small close clusters, few-flowered; the scales of the involucre glabrous, broad, white, with abrupt green tips. Rays much longer than the disk.

§ 2. *Involucre mostly shorter than the disk; the scales linear or narrowly-oblong, less rigid and appressed; the tips greenish but scarcely squarrose.*

3. *S. tortifolius* (Nees): slightly canescent with a minute dense pubescence; leaves short, spatulate-oblong or obovate, entire, mucronulate, 1-nerved, obscurely punctate, spreading and usually vertical, both surfaces similar, heads

in loose compound corymbs, mostly pedicellate and bibracteate; scales of the obovoid involucre narrowly oblong, with acutish slightly spreading tips; rays longer than the copious white pappus.—*Nees, Ast. p.* 151; *DC.! l. c.* Conyza bifoliata, *Walt. Car. p.* 204. Aster tortifolius, *Michx.! fl.* 2. *p.* 109; *Ell.! sk.* 2. *p.* 341.

β. Collinsii: leaves sparingly crenate-serrate.—Aster (Leucocoma) Collinsii, *Nutt.! in jour. acad. Philad.* 7. *p.* 82.

Barrens and dry pine woods, Virginia! and North Carolina! to Florida! and Louisiana! *β.* Florida, *Mr. Ware!* Aug.–Sept.—Plant about 2 feet high, branched above. Leaves 6–12 lines long, rigid.—Heads as large as in S. conyzoides, seldom clustered. Flowers of the disk 10 or more. Achenia short.—In a specimen collected in Virginia by Mr. Durand, the lower leaves are sparingly crenate-serrate, and the others entire.

4. *S. Oregonensis* (Nutt.): nearly glabrous; leaves broadly lanceolate, rather acute, entire, 1-nerved, veiny, both sides and especially the margins scabrous; heads clustered in small compact corymbs; scales of the turbinate involucre oblong-linear, 1-nerved; rays longer than the (white) pappus; achenia slender.—*Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 302.

Oregon, *Nuttall!*—Plant apparently rather large and stout, somewhat branched. Leaves 2–3 inches long, nearly half an inch wide, thickish, narrowed at the base; those of the branchlets small. Heads rather larger than in the following species, about 15-flowered. Achenia not very densely silky, nearly linear, fully half the length of the pappus.—We have reason to think that this will prove a mere variety of the succeeding; yet the exserted rays may afford a constant character.

5. *S. rigidus* (Lindl.): nearly glabrous; leaves oblong-spatulate, or oblanceolate, obtuse, often mucronulate, entire, somewhat 3-nerved, veiny, both surfaces very scabrous, the margins ciliate-scabrous; heads clustered in small compact corymbs; scales of the turbinate involucre narrowly oblong or linear, 1-nerved; rays shorter than the (white) pappus; achenia rather slender.—*Lindl.! in Hook. fl. Bor.-Am.* 2. *p.* 14, & *in DC. l. c.*; *Nutt.! l. c.* (*β.* lævicaulis.) Galatella platylepis, *Nees, in herb Arn.*

Low hills and gravelly soil, Oregon, around Fort Vancouver, &c. *Douglas! Dr. Scouler! Nuttall!* July–Aug.—Plant 1 to 2 feet high; the simple stems, or the few corymbose branches, terminated by small compact corymbs. Leaves an inch in length, rigid. Heads about 15-flowered, nearly as large as in S. conyzoides. Inner scales of the involucre about the length of the disk, scarious; the exterior with somewhat squarrose greenish tips. Rays inconspicuous, but perhaps always present, and fertile. Achenia when mature about half the length of the pappus, not very densely silky.

26. ASTER. *Tourn. inst. t.* 174; *Linn. gen. no.* 954. (excl. spec.)

Aster, Biotia, Tripolium, Heleastrum, & species of Calimeris, *DC.*

Heads many-flowered; the ray-flowers in a single series, pistillate; those of the disk tubular, perfect. Scales of the involucre more or less imbricated, usually with herbaceous or foliaceous tips. Receptacle flat, alveolate, or rarely naked. Appendages of the style (in the disk-flowers) lanceolate or subulate, acute, rarely triangular or obtuse. Achenia usually compressed. Pappus simple, of numerous, often unequal, scabrous capillary bristles.—Perennial herbs, or rarely annual (Tripolium), chiefly natives of North America. Leaves alternate, entire or serrate. Heads corymbose, paniculate, or racemose. Rays white, purple, or blue; the corolla of the disk yellow, often changing to purple.

We are greatly indebted to several botanists and public institutions of this country for the use of their entire collections of American Asters; and we would especially render our acknowledgments to Sir Wm. Hooker, who, by most liberally entrusting to our care his vast materials in this and other allied genera, has afforded the most important assistance. Notwithstanding the very favourable opportunities we have enjoyed, our arrangement of this, probably the most difficult genus in North American botany, although the result of much labor, is by no means so satisfactory as could be desired. Although much remains to be done before our species can be considered as well settled, still we trust that our attempt will be found to have contributed to this result, and that most of our indigenous Asters may be satisfactorily identified by the student. The chief remaining difficulties relate to the species of the sections *Dumosi* and *Salicifolii* of Aster proper, which may probably be hereafter much better defined, and also somewhat increased in number, in some instances perhaps by the separation of species which we have ventured to unite, as well as by the identification of various cultivated plants with their native originals. It is well known that many of the enumerated species, both of earlier and later authors, have been described from plants long cultivated in European gardens, where they have doubtless undergone great alterations in appearance; to say nothing of the strong probability of occasional hybridization. A large, and indeed increasing number of these are only known as garden plants; and it is probable that many will never be identified with their original types; even supposing them to have been derived in all cases from this country, which is by no means certain. As we have chiefly directed our attention to the indigenous plants, and have drawn our descriptions from these alone, we have thought it advisable to bring together, at the close of our account of the proper Asters known to us, those species of garden origin which we have not identified with native specimens. A fuller comparison than we have been able to institute will doubtless considerably reduce their number. Those botanists who are most familiar with our Asters in their native situations, and with the changes produced by difference of soil, exposure, season, &c. will not be greatly surprised at numerous reductions of species which others may think unwarranted. We have only to say, that we have seldom ventured upon such reductions, except on the authority of a full suite of specimens which appeared to present absolute transitions. An obvious difference between two or three specimens is often entirely inappreciable in a fuller series, and thus loses its value as a means of distinction: but the claims of a genuine species are generally confirmed by a large number of specimens. It must, however, be admitted that, in this as in all large and natural genera, several species which we cannot but consider as distinct (such for instance as A. cordifolius and A. sagittifolius) do frequently present very puzzling intermediate forms; and that an apparent transition is not always real. Yet it is better, perhaps, to hazard the occasional reduction of even true species to varieties, than to multiply species which we are confessedly unable to define. We may remark, in conclusion, that we are the more inclined to act upon our own convictions, on account of the very frequent and wide disagreement even of the highest authorities upon this genus.

§ 1. *Involucre obovate-campanulate; the scales regularly imbricated in several series, appressed, nearly destitute of herbaceous tips; the exterior successively shorter: receptacle alveolate: rays* 6–15: *appendages of the style subulate-lanceolate, recurved or diverging, minutely hispid: bristles of the pappus unequal, rather rigid; the inner series mostly slightly thickened towards the apex: achenia linear, slender, scarcely compressed, somewhat 3-angled or striate: stem corymbose at the summit: leaves* (*ample*) *mostly petioled, coarsely serrate; the radical and lower cauline on long petioles, cordate.*—BIOTIA, DC.

1. *A. corymbosus* (Ait.): stem slender, often flexuous, terete; leaves membranaceous, coarsely or incisely and unequally serrate with sharp spreading teeth, conspicuously acuminate, all but the uppermost cordate and on slender naked petioles, ovate or ovate-lanceolate; heads loosely corymbose; involucre shorter than the disk; the exterior scales roundish-ovate; rays (white) 6–9.—*Ait. Kew.* (*ed.* 1) 3. *p.* 207; *Willd. spec.* 3. *p.* 2036;

Pursh! fl. 1. *p.* 552; *Ell. sk.* 2. *p.* 365. A. divaricatus, *Linn. spec.* 2. *p.* 873? (fide *herb.!*) excl. syn. *Gronov. & Pluk.* Eurybia corymbosa, *Cass. in dict. sci. nat.* 27. *p.* 487; *Nees, Ast. p.* 143; *Lindl.! bot. reg. t.* 1532; *Hook.! fl. Bor.-Am.* 2. *p.* 14; *Darlingt.! fl. Cest. p.* 469. Biotia corymbosa, *DC.! prodr.* 5. *p.* 265.

Dry woodlands, Canada and Northern States! to the middle country or mountains of the Southern States! July–Aug.—Stem 1–2 feet high, glabrous, or pubescent towards the summit, where it branches into a loose (often somewhat leafy) corymb. Leaves very thin and membranaceous, 2–4 or 5 inches long, strongly serrate with sharp and spreading rather distant and irregular teeth, which are tipped with conspicuous mucronate-acuminate points, glabrous or sparsely hairy above, and often hairy on the midrib and veins beneath, as also the slender petioles, varying from broadly ovate to ovate-lanceolate, but all except the uppermost cordate; the upper rarely with margined petioles; the uppermost sessile and sparingly serrate. Heads smaller than in the following species, the outer scales of the involucre (smooth, except the ciliate-pubescent margin) rounder and less rigid. Pappus tawny. Achenia nearly glabrous when mature.—Lindley cites the Aster cordifolius of Michaux as a synonym of this species, on the authority of a specimen communicated by A. Richard: but, if we mistake not, the chief specimens of his proper herbarium accord with the Linnæan A. cordifolius.

2. *A. macrophyllus* (Linn.): stem stout, somewhat striate-angled, roughish-pubescent above, the corymbose branches also rigid; leaves thickish, scabrous, closely serrate, somewhat acuminate; the radical and lower ones (large) cordate, on slender petioles; the upper sessile or on margined petioles; heads in ample corymbs; involucre nearly the length of the disk; the exterior scales rigid, oblong or ovate-oblong; rays (white or purplish) 12–15.—*Linn.! spec.* (*ed.* 2) 2. *p.* 1232; *Ait. Kew.* (*ed.* 1) 3. *p.* 207; *Michx.! fl.* 1. *p.* 114; *Willd. spec.* 3. *p.* 2037; *Pursh! fl.* 2. *p.* 552. Eurybia macrophylla, *Cass. in dict. sci. nat.* 27. *p.* 487; *Nees, Ast. p.* 140 (excl. syn. Ast. divaric. &c.); *Darlingt.! fl. Cest. p.* 465; *Hook.! fl. Bor.-Am.* 2. *p.* 14. Biotia macrophylla, *DC.! prodr.* 5. *p.* 265.

β. stem and leaves nearly smooth and glabrous; heads usually smaller.—Aster Schreberi, *Nees, synops. p.* 16; *Spreng. syst.* 3. *p.* 535. Eurybia Schreberi, *Nees! Ast. p.* 138. Biotia Schreberi, *DC.! l. c.* (Varies, with the heads somewhat glomerate on short pedicels, and the rays shorter; apparently an accidental state. Eurybia glomerata, *Bernh. in Nees, Ast. l. c.* Biotia glomerata, *DC.! l. c.*)

γ. exterior scales of the involucre broadly ovate or roundish-oval; otherwise as in *α.*

Woodlands, Canada! (from the Saskatchawan!) and Northern States! Aug.–Sept.—Stem 1½–3 feet high, usually broadly corymbose; the upper portion, as well as the pedicels and involucre, clothed with a close puberulence which appears glandular or viscid under a lens, often with roughish hairs intermixed; below, as also the petioles, either smooth or with a rough pubescence. Radical leaves 4–10 inches long and 3–6 in width, varying from roundish-cordate to cordate-oblong, serrate with broad and short mucronate teeth, often sparsely hirsute, and usually hairy on the midrib and strong veins beneath; the petioles 4–12 inches long: cauline leaves smaller, ovate or oblong; the upper closely sessile; the lower abruptly narrowed into a margined or winged petiole. Heads mostly large: the involucre about half an inch in diameter; the exterior rigid scales pubescent-ciliate, acutish or obtuse; the innermost much larger and membranaceous. Pappus tawny, or reddish. Achenia linear, obscurely striate, almost glabrous when mature.—There are certainly but two species of Biotia indigenous to the United States. B. (Eurybia, *Nees*) commixta, *DC.* is of doubtful origin; but perhaps it is only a form of this species.

§ 2. *Scales of the involucre imbricated in several series, coriaceous, with herbaceous spreading or squarrose tips: receptacle alveolate: rays numerous* (12–30)*: appendages of the style lanceolate: bristles of the pappus rigid, unequal, a portion of the inner more or less thickened towards the summit: achenia narrow, angled or striate, slightly or scarcely compressed: cauline leaves sessile, rigid; the radical never cordate: heads large and showy.* —CALLIASTRUM.

This section closely approaches Biotia through Aster Radula, and Sericocarpus by A. gracilis: it appears to form a very natural group. The inner bristles of the pappus become more rigid and more evidently thickened above as they grow old.

3. *A. Radula* (Ait.): stem strict, glabrous, angled with decurrent lines, somewhat corymbose at the summit; the branches few, nearly simple and naked, slightly pubescent; leaves lanceolate or oblong-lanceolate, acuminate, mostly narrowed towards the base, closely sessile, scabrous both sides and somewhat rugose, sharply serrate, at least in the middle; involucre campanulate-hemispherical, shorter than the disk; the scales oblong, rather obtuse, pubescent-ciliate, appressed, with slightly spreading herbaceous tips; achenia glabrous, linear-oblong, many striate.—*Ait. Kew.* (*ed.* 1) 3. *p.* 210; *Pursh, fl.* 2. *p.* 556; *Nees, Ast. p.* 43; *Hook.! fl. Bor.-Am.* 2. *p.* 7; *DC.! prodr.* 5. *p.* 230.

β. leaves ovate-lanceolate, or the lower ones somewhat obovate-oblong, acute or slightly acuminate.—A. nudiflorus, *Nutt. gen.* 2. *p.* 157; *Darlingt.! fl. Cest. p.* 462; *DC. l. c.*

Moist copses and low grounds, Nova Scotia (*Aiton*) and Newfoundland! Lubeck, Maine, *Mr. Oakes!* Near Boston and Salem, Massachusetts, *Nuttall! Dr. Greene! Dr. Pickering!* New London, Connecticut, *Mr. Roland!* Swamps of New Jersey, *Dr. Stuve*, ex *Nutt.* "On the high mountains of New York and Pennsylvania," *Pursh.* Bethlehem, Pennsylvania, *Schweinitz!* and near Westchester, *Mr. D. Townsend!* (the southern forms more luxuriant and corresponding with A. nudiflorus, *Nutt.*) Aug.–Sept.—Plant 1–3 feet high. Leaves numerous, 2–3 inches long, nearly equal in size to the summit of the stem, varying from half an inch to more than an inch in width, pinnately veined, rough, hairy on the veins beneath, often entire towards the base; the teeth sharp and salient, or sometimes rather obtuse, mucronate. Heads few, large (smaller than in A. spectabilis), 1–3 upon each branch of the simple corymb; the oval-oblong or linear oblong (often acutish) scales of the involucre with bright green, sometimes slightly spatulate tips, nearly glabrous except the margins. Rays numerous, elongated, pale violet; the disk yellow, turning brownish. Achenia narrowly oblong or fusiform, turgid, slightly compressed when mature. Pappus rather rigid; the longer bristles somewhat thickened near the apex.—The Pennsylvanian is larger than the Newfoundland plant, but otherwise they perfectly accord. We have gathered this species in the Berlin Botanic garden, under the name of Biotia commixta, var. stricta.

4. *A. biflorus* (Michx.): low; stems very simple, slender, bearing two (rarely a single) pedunculate heads at the summit; leaves broadly lanceolate, very acute, remotely [and sharply] serrate; scales of the appressed-imbricate involucre lanceolate [heads large]. *Michx.! fl.* 2. *p.* 115; *Nees, Ast. p.* 39. A. strictus, *Pursh, fl.* 2. *p.* 556, not of *Poir.*

Around lakes and rivers which flow into Hudson's Bay, *Michaux.* Labrador, and on high mountains of Pennsylvania, *Pursh.* Labrador, *Herb. Schweinitz!*—The following particulars are added by Pursh, whose Labrador plant (*Herb. Banks.*) is probably the same as Michaux's A. biflorus: Plant from 4 inches to a span high: leaves scabrous: flowers middle-sized;

the rays pale violet, disk brownish-yellow: scales of the involucre oblong, acute, nearly equalling the disk.—According to Nees, who examined a specimen in the Willdenovian herbarium, the stem is glabrous, and the closely imbricated scales of the involucre ovate-oblong, rather acute.—The specimen in the Schweinitzian herbarium resembles a very dwarf state of A. Radula, with which it accords in its pappus and narrow glabrous achenia; but the more membranaceous scales of the involucre are much fewer in number, acute, and nearly equal in length.

5. *A. montanus* (Richards.): rhizoma creeping; stems pubescent or villous below, tomentose and mostly corymbose at the summit, leafy; leaves oblong, serrate, veiny, somewhat hairy beneath, sessile; the lowermost somewhat spatulate, the upper lanceolate; scales of the campanulate-hemispherical involucre canescently tomentose, lanceolate, acute, unequal, closely imbricated in 3 or more series, with herbaceous spreading summits; rays narrow, numerous; achenia linear, elongated, many-ribbed, sparsely hirsute.—*Richards.! appx. Frankl. journ. ed.* 2. *p.* 32, not of *Nutt.* A. Richardsonii, *Spreng. syst.* 3. *p.* 528; *Nees, Ast. p.* 30; *Hook.! fl. Bor.-Am.* 2. *p.* 7; *DC. prodr.* 5. *p.* 229. A. Sibiricus, *Turcz.! in herb. Hook.*

β. giganteus: stem large and stout, more tomentose; leaves ample, more deeply and sharply serrate, pubescent-tomentose beneath.—A. Richardsonii *β.* giganteus, *Hook.! l. c.*

γ. arcticus: stems smaller, often simple and bearing a solitary head; scales of the more simple involucre fewer; the exterior more foliaceous and as long as the disk.—A. salsuginosus? *Less.! in Linnæa*, 6. *p.* 124. A. Espenbergensis, *Nees! Ast. p.* 36; *DC.! l. c.* A. Sibiricus, *Fischer! in herb. Hook.*

Barren country from lat. 64° to the Arctic Sea, *Richardson!* Rocky Mountains, *Drummond!* Also in Siberia (*Herb. Pall.* fide *Richards. & herb. Hook.!* ex *Turcz.*) *β.* Fort Franklin on the Mackenzie River, *Richardson!* *γ.* Kotzebue's Sound, &c. *Chamisso! Capt. Beechey!*—Stem varying from 5 inches to a foot or more (in *β.* 2 feet) in height, often branched at the base, usually simply corymbose at the summit; the tomentose erect peduncles thickened under the heads. Leaves 1 to 3 inches long, feather-veined, either obscurely or conspicuously serrate with pointed teeth. Heads as large as in A. alpinus: the involucre, in the fully developed states, broadly campanulate rather than hemispherical, at first about the length of the disk, but mostly shorter than the pappus; the exterior scales successively shorter and more herbaceous; the inner with purple summits; in *β.* all rather looser and less unequal; in *γ.* with the exterior more foliaceous and lax or bracteolate, equalling or exceeding the innermost, so as to resemble an Alpigenous Aster. Receptacle alveolate. Rays apparently purple, much longer than the disk; the corolla of the disk turning purple. Appendages of the style lanceolate-oblong, rather obtuse. Pappus copious, reddish-brown when old, unequal, some of the longest series slightly thickened at the summit. Achenia attenuated, strongly striate, sparsely hairy when mature.—A well-marked species, with the involucre of the section Amelli, and the achenia and pappus of Biotia, or of most species of Calliastrum; but in the extremely reduced arctic forms, the involucre simulates an Alpigenous Aster, which the larger states are very unlike, although an approach to this form is occasionally presented. The var. *β.* is a larger, coarser, and much more tomentose state, with the leaves often an inch and a half wide, resembling A. conspicuus, except as to pubescence.

6. *A. conspicuus* (Lindl.): stem stout, strict, corymbose at the summit; the branches erect, minutely pubescent, mostly leafless and bearing single heads; leaves oblong or broadly lanceolate, acute, serrate with coarse spreading teeth, slightly pubescent and scabrous, sessile; the lower narrowed at the

base; involucre hemispherical-campanulate, about the length of the disk; the scales numerous, unequal, glandular-puberulent, lanceolate, with acute herbaceous squarrose-spreading tips; rays numerous; achenia linear-oblong, silky-pubescent.—*Lindl.! in Hook. fl. Bor.-Am.* 2. *p.* 7, & *in DC. prodr.* 5. *p.* 230.

Carlton House, on the Saskatchawan River (about lat. 53°), to the Rocky Mountains, *Drummond!*—A stout showy species, with ample thickish veiny leaves (4–6 inches long and 1–2 wide, the teeth triangular and mucronate or subulate-pointed), and heads fully as large as those of A. spectabilis, to which it bears considerable resemblance. Involucre and peduncles viscid with a minute glandular pubescence. Rays large, blue. Appendages of the style triangular-lanceolate. Bristles of the pappus slightly rigid, similar, and scarcely, if at all thickened upwards.

7. *A. spectabilis* (Ait.): stem strict, puberulent-scabrous, glandular-pubescent and corymbose at the summit; leaves oblong-lanceolate, scabrous, sessile, entire; the lower ones oblong, remotely appressed-serrate, tapering into a short margined petiole; branches of the corymb usually short and rigid, bearing 1–3 heads; involucre hemispherical-campanulate, as long as the disk; the scales very numerous, somewhat equal in length, linear-oblong and slightly spatulate, glandular-puberulent, somewhat ciliate, with conspicuous herbaceous squarrose spreading (rather obtuse) tips; rays numerous (20 or more); achenia linear, slightly pubescent.—*Ait. Kew.* (*ed.* 1) 3. *p.* 209; *Pursh, fl.* 1. *p.* 554; *Nutt.! gen.* 2. *p.* 157; *Nees, Ast. p.* 42; *Lindl.! bot. reg. t.* 1527; *DC.! prodr.* 5. *p.* 230. A. grandiflorus, *Walt. Car. p.* 209. A. elegans, *Willd. spec.* 3. *p.* 2042, in part, fide *Nees.* A. speciosus, *Hornem. hort. Hafn.* 2. *p.* 816? fide *DC.*

β. flowering branches, or peduncles, few and slender, mostly simple, pilose with slender hairs as well as glandular-pubescent; leaves lanceolate, entire or scarcely serrate.

γ. branches of the corymb few and mostly simple; leaves obovate-oblong, often nearly all serrate.—A. spectabilis *β.* bellidifolius, *Nutt. l. c.?* A. surculosus? *Ell.! sk.* 2. *p.* 354.

Dry sandy soil and pine barrens, Massachusetts (New Bedford, *Mr. T. A. Green!*) and New Jersey! to Florida! and Kentucky! Sept.–Nov.—Rhizoma slender, creeping. Stem 1–2 feet high. Leaves 2–4 inches long (the upper ones smaller), half an inch to an inch in width, of a firm texture, acute or obtuse, mucronulate, sometimes obscurely 3-nerved. Branches of the corymb or peduncles with a few small leaves or bracts (the uppermost approximate to the head), usually short and rigid. Heads showy (larger than in A. Amellus); the scales of the involucre imbricated in several series; the exterior loose, clothed more or less with a glandular-scabrous pubescence similar to that of the branches. Rays very long, lanceolate, blue or violet. Appendages of the style lanceolate-subulate.—We have met with no authentic specimen of Mr. Nuttall's var. bellidifolius. Perhaps he had a form of the closely allied A. gracilis in view; since the latter is common in the pine barrens of New Jersey, while he only mentions it as a Western plant.

8. *A. gracilis* (Nutt.): stems several from the same often surculose caudex, slender, slightly pubescent, corymbose at the summit; leaves somewhat scabrous, remotely and obscurely crenulate-serrate; the radical ones oblong or spatulate, on slender naked petioles; the cauline oblanceolate or narrowly oblong, often narrowed at the base, slightly clasping; heads several, in a spreading corymb; involucre obconical, as long as the disk; the scarcely pubescent scales imbricated in several series, whitish and coriaceous, with herbaceous (obtuse or slightly pointed) spreading tips; the exterior succes-

sively shorter; rays about 12; achenia cuneiform-oblong, moderately compressed, minutely hairy.—*Nutt.! gen.* 2. *p.* 158.

Prairies of Kentucky & Tennessee, *Nuttall!* Pine barrens of New Jersey! common. Sept.—Caudex usually tuberous, producing runners and offsets. Stems about a foot high, not scabrous or glandular, leafy, either simple and bearing 5 to 9 heads in a terminal corymb (the central head almost sessile, the lateral on slender spreading or divaricate peduncles); or with corymbose flowering branches, each bearing 3 to 7 heads, all but the lateral or external on very short pedicels. Leaves 1 to about 2 inches long, nearly coriaceous, opaque, glabrous. Involucre almost exactly like Sericocarpus conyzoides! and about the same size; the exterior scales subspatulate-oblong or linear-oblong, somewhat ciliate; the innermost linear, membranaceous. Heads about 30-flowered. Rays violet; the ligules exserted about the length of the involucre. Achenia rather short, impressed-striate, clothed with short sparse hairs.—Mr. Nuttall has correctly remarked the alliance of this plant to A. spectabilis on the one hand (some forms of which it greatly resembles), and to Sericocarpus conyzoides on the other: it almost connects the latter genus with Aster.

9. *A. surculosus* (Michx.): stems several from the same surculose caudex, slender, simple, minutely pubescent above; leaves lanceolate, elongated, acute, glabrous, the margin scabrous, entire or with a few slight subulate teeth; the lowermost tapering into a margined somewhat sheathing petiole; the upper ones linear, partly sheathing or clasping at the base; heads 3–5 in a simple corymb (sometimes solitary); involucre turbinate-hemispherical, nearly as long as the disk; the scales numerous, somewhat equal in length, pubescent, with spreading herbaceous mostly mucronulate tips; the outermost lanceolate and chiefly foliaceous; rays numerous; achenia linear, almost glabrous.—*Michx. fl.* 1. *p.* 112; *Nutt.! gen.* 2. *p.* 157; *Nees, Ast. p.* 40; *DC. l. c.*

Woods, Burke County, N. Carolina, *Michaux.* Margins of open bushy swamps in Tennessee, N. Carolina! and Virginia, *Nuttall.* Wilmington, N. Carolina, *Nuttall! Mr. Curtis!* Southern States, *Mr. Croom!* Sept.—Rhizoma creeping. Stems somewhat angled, 6–18 inches high; the summit, peduncles &c. pubescent but not glandular. Leaves rather scattered, rigid, opaque (the lower obscurely 3-nerved), smooth and shining; the lower 4–6 inches long, lanceolate or spatulate-lanceolate; the cauline successively reduced to one or two inches in length, often narrowly lanceolate-linear; the uppermost confluent with the scales of the involucre. Heads as large as in A. spectabilis; the rays long, linear, violet. Exterior scales of the involucre loose, lanceolate; the others linear-spatulate or narrowly cuneiform, rigid, white at the base, the tips herbaceous, mucronulate; the innermost nearly membranaceous. Achenia striate, slender, somewhat compressed.—The dwarfish state of this species (which we believe to be Michaux's) approaches A. spectabilis, while the most slender forms considerably resemble the very different A. paludosus.

10. *A. paludosus* (Ait.): stem slightly puberulent or scabrous; leaves linear, entire, acute, rigid, partly clasping, with the margins scabrous, often fringed with bristly hairs near the base; heads few, racemose, or terminating the mostly simple axillary and somewhat racemose branches; involucre hemispherical, nearly the length of the disk, mostly bracteolate; the scales numerous, somewhat equal in length, partly foliaceous, lanceolate or spatulate-linear, mucronate, somewhat squarrose; rays numerous; achenia linear-oblong, nearly glabrous.—*Ait. Kew.* (*ed.* 1) 3. *p.* 201; *Pursh, fl.* 1. *p.* 547; *Ell. sk.* 2. *p.* 343. A. grandiflorus, *Nutt.! gen.* 2. *p.* 156; not of *Linn.* Tripolium paludosum, *Nees, Ast. p.* 155. Diplopappus paludosus, *Lindl.! in herb. Hook. &c.* Heleastrum paludosum, *DC.! prodr.* 5. *p.* 264.

Wet pine barrens and swamps, from North Carolina! to Florida! Louisiana! and Arkansas! Aug.–Oct.—Stems 1–2 feet high. Leaves coriaceous, somewhat erect, 2–4 inches long, 2–3 lines wide, pointed, strongly 1-nerved, or with 2 obscure lateral nerves; the uppermost often concave. Heads large (the disk half of an inch in diameter), usually 3 to 8 disposed in a somewhat racemose manner on short nearly naked peduncles, sometimes axillary on very short peduncles, forming a kind of spike; but the lower peduncles, or branchlets, often elongated, so as to become corymbose, or branching and paniculate. Exterior scales of the involucre usually loose and bracteolate, or passing into the bracteate leaves which subtend the head, almost entirely foliaceous, somewhat ciliate; the innermost with the tips only herbaceous, or sometimes colored. Rays (about 24) nearly an inch long, deep blue. Pappus tawny, rather rigid; the bristles unequal; the larger ones gradually thickened upwards so as to appear slightly clavate under a lens, but scarcely more so than in the preceding species. Achenia glabrous, or slightly pubescent when young, somewhat angled and striate, slender, scarcely compressed.—This species is, we believe, confined to the Southern States. Mr. Nuttall's A. paludosus is probably a form of our A. elodes. What can be the plant from Northern British America mentioned by Dr. Richardson under this name?

11.? *A. Curtisii:* smooth and glabrous; stem (apparently) simple, leafy, slightly corymbose or racemose at the summit; the branches short, rigid, bearing single or few heads; leaves lanceolate, sessile, attenuate-acute, serrate, with scabrous or somewhat ciliate margins; the lowermost tapering into a winged petiole; scales of the hemispherical involucre oblong or slightly spatulate, unequal, imbricated in about 4 series, coriaceous, with conspicuous abruptly foliaceous squarrose-reflexed summits; achenia narrow, glabrous.

On Table Mountain &c. N. Carolina, *Mr. M. A. Curtis!*—Stem strict, apparently 2 to 3 feet high, smooth throughout, leafy to the summit, with a few short spreading flowering branches, which bear single or 3–5 racemose heads; the lateral ones on short pedicels. Leaves somewhat membranaceous, tapering to a very acute point, entirely smooth on both sides, or slightly scabrous next the margins of the upper surface or near the apex, pale beneath, with rather prominent reticulated veinlets; all but the uppermost conspicuously but somewhat irregularly serrate, the base and apex entire; the lowermost (radical unknown) about 4 inches long and two thirds of an inch wide, narrowed rather abruptly into a margined or winged petiole, coarsely serrate; the upper similar, but narrower and less tapering at the base; the uppermost closely sessile, often entire; those of the branchlets minute and bract-like, thickish, obtuse. Heads about as large as those of A. spectabilis, subglobose. Scales of the involucre numerous, white and coriaceous below, appressed; the foliaceous summits (oval or lanceolate, often acute) abruptly squarrose or recurved, sometimes equal in length to the appressed portion. Rays large, 20 or more, blue or purple. Bristles of the pappus slender, rather soft, the inner series very obscurely thickened upwards.—We have but two specimens of this apparently well-marked species, collected we believe in different localities, neither of which are so perfect as could be desired. Perhaps it belongs to the Grandiflori, rather than to the present division.

§ 3. *Scales of the involucre imbricated in various degrees, with herbaceous or foliaceous tips, or the exterior entirely herbaceous: receptacle alveolate: rays numerous: appendages of the style lanceolate: bristles of the pappus capillary (soft) and nearly uniform, none of them thickened at the apex: achenia compressed.*—**ASTER proper.**

* *Heads (large) corymbose or racemose; scales of the involucre imbricated in several series, rigid, with herbaceous or foliaceous summits, somewhat squarrose or spreading; the innermost usually membranaceous: achenia broad, compressed, pubescent or hairy.*—Amelli.

12. *A. integrifolius* (Nutt.): stem simple, villous-pubescent, the summit and the simple corymb glandular and viscid; leaves oblong-lanceolate, acute, entire, 1-nerved, veiny; the radical and lowest cauline tapering into a margined petiole, almost glabrous; the others clasping, somewhat pubescent or glandular; heads few (3–5); scales of the involucre loosely imbricated in 2–3 series, lanceolate, acute, glandular, herbaceous, somewhat unequal; achenia minutely silky-hirsute.—*Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 291.

Rocky Mountains in lat. 42°, growing at a lower elevation than A. andinus or A. glacialis, *Nuttall!*—Plant 6–12 inches high, stout. Heads nearly the size of A. Amellus; to which this species more closely approaches than to any other. Leaves rather coriaceous, with a strong midrib (not triplinerved); the numerous reticulated veinlets somewhat conspicuous on both surfaces of the older leaves; the radical 3–5 inches long, including the petiole. Exterior scales of the involucre broadly lanceolate, entirely herbaceous, the margins not membranaceous; the innermost narrower, but similar, membranaceous at the base. Rays "bluish-purple, 15–25" (*Nutt.*), rather large. Pappus of unequal slightly rigid strongly scabrous bristles. Appendages of the style linear-lanceolate, hirsute.

13. *A. spathulatus* (Lindl.): stems low, bearing a few simple racemose branches; leaves narrowly spatulate, obtuse, entire, somewhat nerved, nearly glabrous; the uppermost lanceolate, dilated at the base and partly clasping, often acute; peduncles simple, nearly naked, tomentose-pubescent; scales of the involucre linear or oblong-linear, acute, pubescent, rather unequal, in 2–3 series, erect, with foliaceous somewhat spreading summits.—*Lindl.! in Hook. fl. Bor.-Am.* 2. *p.* 8, *& in DC. prodr.* 5. *p.* 231.

Arctic America, at Bear Lake and Fort Franklin on the Mackenzie River, *Richardson!*—Plant 5–10 inches high, slightly pubescent with appressed hairs. Radical and lower leaves 2 to 3 inches long, 3–4 lines wide, of uniform appearance on both sides, often nearly linear; the lateral nerves somewhat reticulated. Heads few, about as large as in A. Amellus. Achenia hairy, compressed.

14. *A. adscendens* (Lindl.): stems low ascending; the branches simply racemose or somewhat corymbose; radical and lower leaves oblong-linear or narrowly spatulate, glabrous, entire, with ciliate-scabrous margins; the cauline linear-lanceolate, partly clasping; scales of the hemispherical involucre numerous, closely imbricated, unequal, nearly glabrous; the exterior linear-oblong, obtuse, the innermost acute; achenia minutely hairy.—*Lindl.! in Hook. fl. Bor.-Am.* 2. *p.* 8, *& in DC. prodr.* 5. *p.* 231.

β. denudatus: leaves more strongly ciliate-scabrous; the radical and lowermost somewhat fringed towards the base; the cauline small.—A. denudatus, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 292.

γ. ciliatifolius: stem not denuded and scapiform, pubescent above; leaves more proportionate, distinctly ciliated; scales of the involucre ciliate, somewhat acute.—A. denudatus *β.* ciliatifolius, *Nutt. l. c.*

Banks of the Saskatchawan towards the Rocky Mountains, *Drummond!* *β.* & *γ.* Arid and dry grassy plains in the Rocky Mountains near Lewis River, about lat. 42°, *Nuttall!*—Rhizoma creeping. Stems 8 to 16 inches high, bearing several racemose or somewhat paniculate-corymbose heads, which are smaller than in A. Amellus. Leaves rigid, the lowermost 2–4 inches long, slightly veined when old, tapering into a margined petiole, which is

rather strongly ciliate in var. *β.*; the margins frequently somewhat undulate or remotely denticulate. Involucre equalling or rather shorter than the disk, composed of numerous scales somewhat closely imbricated in several series, rather rigid, often ciliate; the exterior shorter, almost wholly herbaceous; the inner with more acute slightly spreading herbaceous summits. "Rays rose-purple, 30–40, *Nutt.*" Achenia rather broad, compressed, narrowed at the base as if slightly stipitate, 4-nerved, resembling those of A. Amellus, but smaller and minutely hairy. Pappus brownish.—The description of the achenia is drawn from var. *β.*, which differs from Dr. Lindley's plant only in the particulars mentioned above.

15. *A. Chilensis* (Nees): stem racemose-decompound, hairy above in lines; the heads somewhat corymbose or racemose at the summit of the branches; leaves lanceolate, acute, crenate-serrate, clasping, scabrous on both sides; those of the peduncles small, oblong, squarrose; scales of the broadly obovate involucre closely imbricated, oblong, with obtuse spatulate herbaceous summits; achenia pubescent-hirsute when young. *Nees, Ast. p.* 123; *DC. prodr.* 5. *p.* 245. A. Radula, *Less. in Linnæa*, 6. *p.* 125.

β. leaves scarcely scabrous, except near the margins of the upper surface; the cauline narrowed towards the base, partly clasping.—A. spectabilis? *Hook. & Arn.! bot. Beechey, p.* 146.

California, *Chamisso.* *β.* Monterey, California, *Capt. Beechey!*—The plant collected in Capt. Beechey's voyage is smoother than that described by Nees, but it accords in other respects. It is possible that the specimen of Hænke was also collected in California, instead of the mountains of Chili; as great confusion with regard to the localities is said to exist in his collections. It has certainly much affinity with the Conciuni, where Nees places it, but apparently more with the Amelli. The heads are rather smaller than in A. Amellus; the herbaceous tips of the involucral scales are loose or somewhat spreading, with a slight membranaceous margin, somewhat ciliate, otherwise glabrous; the innermost about the length of the disk, rather acute. Young achenia compressed, clothed with a somewhat silky pubescence.

* * *Heads (large) subglobose, terminating the leafy branches: scales of the involucre (rather few and large), somewhat equal in length, imbricated in* 3 *or* 4 *series, foliaceous, except the base, and nearly similar to the (small) oval or lanceolate, usually silky, sessile and entire mucronate leaves, both sides of which are similar in appearance: achenia glabrous, angled or compressed, many ribbed.*—Sericei.

16. *A. sericeus* (Vent.): stems slender, numerous from the same root, glabrous below, branched; leaves silvery-canescent on both sides with a dense appressed silky pubescence, lanceolate or oblong, closely sessile, mucronulate, obscurely 3-nerved; heads mostly solitary terminating the short canescent branchlets; scales of the involucre similar to the uppermost leaves, silvery, squarrose-spreading, the coriaceous base appressed; achenia many-ribbed, glabrous.—*Vent. hort. Cels. t.* 33; *Pursh! fl.* 2. *p.* 548; *Nutt.! gen.* 2. *p.* 155; *Nees, Ast. p.* 51; *DC.! prodr.* 5. *p.* 233. A. argenteus, *Michx.! fl.* 2. *p.* 111.

β. leaves and scales of the involucre rather narrowly lanceolate, less silvery.—A. montanus, *Nutt.! gen. l. c.*

Prairies and dry banks of rivers, nearly confined to the valley of the Mississippi and its tributaries: Arkansas! Mississippi! Missouri! Illinois! to Wisconsin! N. W. Territory! Tennessee and N. Carolina near the mountains, *Nuttall!* (var. *β.*) *Schweinitz!* Aug.–Oct.—Plant 10–20 inches high (said to become a little shrubby at the base by cultivation in Europe), very elegant; the densely silvery-canescent leaves half an inch to an inch long,

crowded on the branches; the radical ones oblanceolate, sessile, about 3 inches long, distinctly 3-nerved. Heads showy, but variable in size. Rays 20–25, half an inch or more in length, deep violet-blue. Achenia evidently compressed when mature. Pappus tawny, equal.

17. *A. phyllolepis:* stems slender, loosely branched; leaves erect, lanceolate, closely sessile, mucronulate, somewhat hairy or canescent when young; those of the branches crowded, ovate-lanceolate, acuminate-cuspidate, appressed, ciliate with long spreading hairs; heads mostly solitary terminating the branchlets; scales of the involucre similar to the upper leaves, loosely imbricated in 2–3 series, glabrous except the fringed margins, reticulated, conspicuously acuminate-mucronate, nearly equal in length; achenia linear, angled, striate or ribbed, glabrous.—A. sericeus *β.* microphyllus, *DC. l. c.?* A. ciliatus, *Nutt. in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 295, not of *Walt.*

Texas, *Berlandier? Drummond!* Western Louisiana, *Dr. Leavenworth! Dr. Hale!*—Plant 10–18 inches high, with virgate somewhat pubescent or hairy branches. Leaves coriaceous, pale, scabrous, somewhat 3-nerved, obscurely reticulated, gradually reduced in size from an inch or more to 4–5 or 6 lines in length; the upper ones more crowded, evidently reticulated, and conspicuously ciliate with long spreading hairs, which are, however, somewhat deciduous. Scales of the hemispherical involucre oval or ovate, or the innermost lanceolate, few, as long as the disk. Heads as large as in the preceding, or sometimes smaller. Rays about 25, elongated, purple. Achenia scarcely compressed. Pappus nearly equal, reddish-brown.

* * * *Heads* (*middle-sized*) *racemose; scales of the turbinate or oboroid involucre imbricated in several series, rather rigid, silky, the exterior successively shorter, all with short herbaceous tips: corolla of the disk as well as the* (12–15) *rays purple or violet: achenia silky-villous: leaves small, lanceolate or oblong, entire, closely sessile, pale, when young canescent, of the same color and appearance both sides.*—Concolores.

18. *A. concolor* (Linn.): stem simple or sparingly branched, virgate; leaves crowded, oblong-lanceolate, mucronulate, minutely silky both sides, or sometimes nearly glabrous when old; the upper ones acuminate-mucronate, appressed; heads in a simple or compound virgate raceme; scales of the involucre lanceolate, acute, somewhat appressed; achenia silky-villous. —*Linn.! spec.* (*ed.* 2) 2. *p.* 1228; *Walt.! Car. p.* 209; *Michx.! fl.* 2. *p.* 111; *Willd. spec.* 3. *p.* 2029; *Pursh! fl.* 2. *p.* 448; *Nutt.! gen.* 2. *p.* 115; *Ell.! sk.* 2. *p.* 350; *Nees, Ast. p.* 115; *DC.! prodr.* 5. *p.* 243. A. caule simplicissimo, &c. *Gronov.! fl. Virg. ed.* 2. *p.* 123. A. foliis lanceolatis sessilibus alternis, &c. *Gronov.! l. c. p.* 125.

Dry sandy soils, and in pine barrens, New Jersey! to Florida! and Louisiana! Aug.–Nov.—Plant 1–3 feet high, with somewhat the habit of a Liatris, sometimes with a tuberous root, often simple or branched only towards the base, and bearing the heads in a long virgate raceme, on short (erect or recurved) peduncles, which are furnished with minute bract-like leaves, frequently branching above and bearing several shorter racemes or sometimes solitary heads. Leaves 1–3 nerved, often obscurely reticulated, rather rigid, grayish; the lower about an inch long, and partly clasping; the upper successively reduced in size, oval or lanceolate, mucronate or cuspidate. Pappus rusty or reddish.

19. *A. Menziesii* (Lindl.): leaves, as well as the stem, canescent with a somewhat scabrous pubescence, lanceolate or oblong-linear, closely sessile, acute; heads racemose; scales of the involucre obtuse, somewhat squarrose. —*Lindl.! in Hook. fl. Bor.-Am.* 2. *p.* 12, & *DC. prodr.* 5. *p.* 243.

Oregon, *Menzies!*—Leaves all slightly auriculate and clasping at the

base; the lowermost oblong-spatulate; the upper lanceolate-linear, all strongly 1-nerved. Peduncles or branches several, simple, or sometimes forked, almost tomentose. Immature achenia canescent. Pappus rusty.—We have only seen the single specimen in Sir Wm. Hooker's herbarium: we doubt if it be so nearly allied to A. concolor as is supposed.

* * * * *Heads (middle-sized, large for the size of the leaves) solitary terminating the numerous diffuse branchlets: scales of the obovoid-turbinate involucre closely imbricated in several series (the exterior successively shorter), coriaceous, spatulate-linear, with short herbaceous slightly squarrose or spreading tips: achenia short, turbinate, minutely canescent: leaves crowded throughout the slender stem and branches, very short and uniform (except the very lowest), thick, hispid-scabrous, ovate-oblong or lanceolate, either appressed or squarrose-reflexed.*—Brachyphylli.

20. *A. squarrosus* (Walt.): stems minutely hispid, diffusely branched; the branchlets short, somewhat paniculate or racemose; leaves triangular-ovate or oblong, mucronulate, squarrose-reflexed.—*Walt.! Car. p.* 209; *Michx.! fl.* 1. *p.* 112; *Willd.! spec.* 3. *p.* 2028; *Pursh, fl.* 1. *p.* 547; *Ell.! sk.* 2. *p.* 530; *Nees, Ast. p.* 115; *DC.! prodr.* 5. *p.* 243.

Dry soil, N. Carolina! S. Carolina! Georgia! and Florida! Sept.–Nov. —Stems (suffruticose at the base?) about 2 feet high; the branches often virgate. Leaves somewhat fleshy and rigid; the radical ones obovate-oblong, sessile, nearly an inch long; the cauline nearly uniform, crowded so as often to appear imbricated downwards, usually 2–3 lines long, minutely hispid, especially on the margins. Involucre one-third to nearly half an inch in diameter; the scales scabrous-puberulent, coriaceous and whitish, except the oval mucronulate spreading foliaceous tips. Rays 15–20, lanceolate-linear, large and showy, bright blue. Pappus brownish when old.

21. *A. adnatus* (Nutt.): minutely hispid-scabrous throughout; ascending stems and branches virgate; leaves ovate-lanceolate or oblong, mucronulate, almost imbricated, appressed, adnate to the stem!—*Nutt.! in jour. acad. Philad.* 7. *p.* 82; *Hook.! compan. to bot. mag.* 1. *p.* 97. A. microphyllus, *Torr.! ined.*; *Lindl.! in DC. prodr.* 5. *p.* 244, (badly described.)

Dry soil, Florida, *Nuttall! Dr. Alexander! Dr. Chapman!* Alabama, *Dr. Gates!* New Orleans, *Drummond!* Sept.–Nov.—Resembles the preceding; the heads and flowers similar. Stems suffrutescent at the base, with loose virgate branches, clothed with the minute leaves (1–3 lines long) quite to the summit. The leaves are coherent to the stem and branches by the midrib, the summit only being free; they are more finely scabrous than in A. squarrosus: the very lowest, which are about three-fourths of an inch long, are nearly or quite free. Rays 'pale lilac' (*Nutt.*), or rather violet-blue.

* * * * * *Heads (rather large) mostly solitary terminating the spreading branchlets: scales of the obovoid-turbinate or somewhat campanulate involucre closely imbricated in several series, rigid, with herbaceous mostly acute and somewhat spreading tips, the exterior successively shorter: achenia linear-oblong, many-striate, silky-canescent: leaves auriculate-cordate and clasping the stem, entire, pubescent or scabrous; those of the branchlets very small.*—Patentes.

22. *A. patens* (Ait.): stem pubescent; paniculate at the summit; leaves ovate-oblong or oblong-lanceolate, pubescent or scabrous, with ciliate and very scabrous (often undulate or almost serrulate) margins, sometimes narrowed below the middle, auriculate-cordate and clasping; those of the spreading or divaricate slender branchlets very small; heads mostly solitary on the branchlets; scales of the involucre lanceolate, scabrous-puberulent;

achenia silky.—*Ait. Kew.* (*ed.* 1) 3. *p.* 201; *Pursh! fl.* 2. *p.* 551; *Nees, Ast. p.* 49 (excl. syn. *Michx.*); *Darlingt.! fl. Cest. p.* 463; *DC.! prodr.* 5. *p.* 232. A. undulatus, *Linn.! spec. ed.* 2. *p.* 1228, & *herb.* (not of *hort. Cliff.!*); *Ell.! sk.* 2. *p.* 361. A. amplexicaulis, *Michx.! fl.* 2. *p.* 114; *Bigel.! fl. Bost. ed.* 2. *p.* 312.

β. *gracilis:* heads smaller, terminating the very numerous and elongated branches; leaves very small, rigid, scabrous.—*Hook.! compan. to bot. mag.* 1. *p.* 97.

γ. *patentissimus:* heads large, terminating the elongated branchlets; the scales of the more turbinate involucre very numerous and more closely imbricated (in 5–6 series), somewhat canescent, the exterior broader and more obtuse; leaves rigid, hirsute-scabrous.—A. patentissimus, *Lindl.! in DC. l. c.* A. Arnottii, *Nees! in herb. Arn.* & *herb. Hook.*

δ. *phlogifolius:* stem simple or paniculate at the summit; the heads (large) solitary, or frequently several and somewhat racemose on the short branches; involucre more lax and herbaceous (imbricated in 3–4 series); leaves much larger, membranaceous, pubescent beneath, scarcely or not at all scabrous, lanceolate or oblong-lanceolate, tapering to an acute point, usually contracted below the middle.—*Nees, Ast. l. c.* (excl. syn. *Michx.*); *Darlingt.! fl. Cest. l. c.* A. phlogifolius, *Muhl.! in Willd. spec.* 3. *p.* 2034; *Pursh! fl.* 1. *p.* 550; *Nutt.! gen.* 2. *p.* 156; *DC.! l. c.* A. auritus, *Lindl. in DC. l. c.?*

Dry soil, Massachusetts! to Florida! and Louisiana! β. Alabama, *Dr. Gates!* Louisiana and Texas, *Drummond!* γ. Kentucky! and Missouri! to Arkansas! and Western Louisiana! δ. Woods, New York! Pennsylvania! and Ohio! to Kentucky! and North Carolina! Aug.–Oct.—Stem rather slender, 1–3 feet high. Heads rather large and showy (in β. less, in γ. & δ. usually more than half an inch in diameter), commonly terminating the elongated and diverging branchlets; which are furnished with numerous minute and bract-like leaves. Rays purplish-blue, about 24. Scales of the involucre minutely pubescent or hairy, more or less granulose-scabrous under a lens; the innermost linear, acute or acuminate (sometimes purplish); the exterior shorter and more obtuse. Pappus ferruginous or tawny.—The scales of the involucre in var. γ. are more numerous and imbricated; and in the plant of Drummond from St. Louis (A. Arnottii, *Nees. ined.*) they are broader, more obtuse, and remarkably appressed: other specimens of this variety (A. patentissimus, *Lindl. in herb. Torr.*, which however have the leaves very scabrous on both sides) pass insensibly into the ordinary state of the plant.—The lower leaves, except in var. δ., rarely exceed one or two inches in length, and are mostly obtuse, but mucronate. In that plant, however, they vary from 3 to 6 inches in length, usually tapering to each end, but are dilated and auriculate at the base; they occasionally present a few remote serratures. We were strongly disposed to consider it a distinct species; but are now convinced by the examination of numerous intermediate forms, that it is a state which the plant assumes in shady moist places.

* * * * * * *Heads (middle-sized, showy) paniculate or somewhat racemose; scales of the turbinate or oboroid involucre closely and regularly imbricated in several series (the exterior successively shorter), chartaceous and white (except the midnerve), with very short appressed or slightly spreading green tips: rays bright blue: achenia very smooth and glabrous (or sometimes minutely pubescent with sparse hairs), broadish, compressed, 2–5-ribbed or nerved: plant perfectly smooth and glabrous (except the branchlets and the scabrous margins of the leaves), often glaucous: cauline leaves lanceolate or oblong-ovate, thickish, sessile or clasping, entire or sparingly serrate; the radical ovate or oblong (small), tapering into a short and margined often ciliate petiole.*—**Concinni, *Nees*, (excl. spec.)**

23. *A. lævis* (Linn.): very smooth, often glaucous; stem loosely paniculate or somewhat corymbose at the summit; leaves lanceolate, ovate-lanceolate, or oblong, coriaceous, very smooth, with scabrous margins, entire or sparingly serrate; the lower narrowed towards the base, or tapering into a margined petiole; the upper clasping and mostly somewhat auriculate or cordate at the base; those of the branches very small; scales of the obovoid involucre closely imbricated, appressed, rigid, lanceolate or broadly linear, with short abruptly acute or acuminate herbaceous tips; achenia shining, glabrous, or pubescent with a few scattered hairs.—*Linn.! spec.* 2. *p.* 876; *Ait. Kew.* (*ed.* 1) 3. *p.* 206; *Lindl. bot. reg. t.* 1500; *Darlingt.! fl. Cest. p.* 468. A. lævis, lævigatus, mutabilis, amplexicaulis, rubricaulis, & cyaneus, *Nees, Ast. p.* 128–132; *DC. prodr.* 5. *p.* 245 & 246. A. rubricaulis, *Lam. dict.* 1. *p.* 305. A. amplexicaulis, *Muhl.! in Willd. spec.* 3. *p.* 2046. A. Pennsylvanicus, *Poir. suppl.* 1. *p.* 498, ex *Nees.*

β. more glaucous; upper leaves cordate-clasping, oblong-lanceolate or ovate-lanceolate; scales of the involucre more numerous.—A. cyaneus, *Hoffm. phytogr. bl. p.* 71, *t. B. f.* 1; *Pursh, fl.* 2. *p.* 550; *Nees, l. c.*; *Lindl. bot. reg. t.* 1495. A. glaucus & A. politus, *Nees, synops. p.* 23. A. bupleurifolius, *Hort. Monsp.*

γ. leaves elongated lanceolate or linear-lanceolate.—A. lævigatus, *Willd. spec.* 3. *p.* 2046?

Borders of woodlands and thickets, Canada! to Georgia! Missouri! and Saskatchawan! common. Aug.-Oct.—A beautiful species, readily recognized (notwithstanding some diversities in the foliage and the size of the heads) by its polished and more or less glaucous stem and leaves (the former 2–3 feet high, often purple); the somewhat coriaceous regularly imbricated and appressed scales of the involucre, which are white (slightly ciliate), with a greenish midnerve, and short rhombic green tips; the heads middle-sized or rather large; and the numerous showy rays bright blue or indigo, changing to violet. The flowers of the disk usually change to purple: the pappus becomes tawny or brownish. We entirely agree with Dr. Darlington in the opinion that it is vain to separate the various forms of this plant into several species. The large suite of specimens before us have been named for the most part by several distinguished botanists, whose determinations so seldom accord that we feel the greater confidence in our own opinion. We can make nothing of the characters derived by Nees from the alveoli of the receptacle, whether naked, ciliolate, or piliferous. The radical leaves are ovate, oval, or spatulate-oblong, serrate, on winged petioles which are usually ciliate at the base; the earliest smaller, more rounded or obtuse, crenate-serrate; the cauline vary from 2 to 5 inches in length, and one-third to an inch and a half in width, the broader ones often abruptly narrowed at the base; the upper surface shining; the reticulations loose and manifest. Branches of the inflorescence rather rigid, loose, few or numerous; the leaves gradually reduced to short lanceolate bracts.

24. *A. virgatus* (Ell.): very smooth; stem strict; the branches few and virgate, racemose at the summit; leaves linear-lanceolate, entire, with scabrous or ciliolate-serrulate margins, partly clasping; those of the branches very small and numerous, erect, subulate-acuminate: the lowermost tapering at the base; the radical spatulate-oblong; scales of the somewhat hemispherical involucre lanceolate, acuminate; the exterior loose or slightly squarrose-spreading; achenia glabrous.—*Ell.! sk.* 2. *p.* 353.

β. stem stout; the virgate branches numerous, somewhat compound; heads larger; lower cauline leaves oblong-lanceolate.

γ. stems slender, often simple; cauline leaves elongated linear-lanceolate, the margins more strongly ciliolate-scabrous.—A. attenuatus, *Lindl.! in Hook. compan. to bot. mag.* 1. *p.* 97.

Western districts of Georgia, *Elliott!* β. Georgia, *Dr. Boykin!* γ. Jack-

sonville, Louisiana, *Drummond!* Western Louisiana, *Dr. Hale!* Sept.–Oct.—Resembles considerably the narrow leaved forms of A. lævis; but is distinguished by the virgate branches and racemose inflorescence; the scales of the involucre with sharper spreading points, the exterior often loose and passing into the very small bract-like leaves; which are usually numerous or crowded on the branches, varying from 3 to 6 lines long, rigid, subulate-acute or acuminate. Lower leaves 3 to 5 or 6 inches long, 3 to 4 (or in *β.* 5–10) lines wide, shining above, coriaceous. The plant of Elliott is intermediate between our specimens from Dr. Boykin (which has shorter and broader cauline leaves, the lower occasionally serrulate) and those of A. attenuatus, *Lindl.* Drummond's specimens are remarkably slender, and about 2 feet high. In those from Dr. Hale, the margins of the leaves are still more strongly serrulate-scabrous, or the uppermost even minutely ciliate-hispid, and the heads are more obconical. Rays apparently deep blue.

25. *A. concinnus* (Willd.): stem nearly glabrous, somewhat corymbose, loose; the branches virgate, dichotomous-paniculate; leaves lanceolate, partly clasping, remotely and sharply serrate, with scabrous margins, those of the branchlets oblong, entire; scales of the involucre linear, acute, closely imbricated. *Nees.—Willd. enum.* 2. *p.* 884; *Nees, Ast. p.* 121; *Lindl. bot. reg. t.* 1619; *DC. prodr.* 5. *p.* 245 (excl. syn. *Colla, hort. Ripul.*); *Hook. fl. Bor.-Am.* 2. *p.* 13? A. cyaneus? *Ell.! sk.* 2. *p.* 244.

β. branches more strict and racemose, with smaller and more numerous leaves. *Nees, l. c.*

North America, *Willdenow.* (In fields and woods, New York & Pennsylvania, *Pursh.*) N. Carolina, *Schweinitz!* (in *herb. Ell.*) Florida, *Mr. Read!* (in *herb. acad. Philad.*) Saskatchawan, *Drummond*, ex *Lindl.!* Sept.–Oct.—We have copied the specific character from Nees, having seen no indigenous specimens which altogether accord with the plant cultivated in the Berlin Botanic garden (from which Willdenow described the species) and elsewhere: the fragment from Saskatchawan (in *herb. Hook.*) is not satisfactory, and may belong to A. lævis. But Elliott's A. cyaneus? (judging from an imperfect specimen) appears to be the same as the cultivated A. concinnus: the upper cauline leaves are linear-lanceolate, and those of the numerous diverging branches narrowly linear; the heads rather smaller than in most forms of A. lævis; and the young achenia are minutely puberulent. The specimen from Florida clearly belongs to the same species; but in its more strict branches and racemose heads it accords with the description of A. concinnus *β.*, *Nees*; and the leaves of the branches are also rather slender and narrowly linear. The rays are blue, and the flowers of the disk change to purple.—We know not from what source the original A. concinnus was derived. Willdenow compares the leaves with those of Phlox maculata; and the stem is said to be one and a half to two feet high.

26. *A. turbinellus* (Lindl.): stem and slender paniculate branches smooth or minutely puberulent-scabrous; leaves lanceolate, smooth, entire, with ciliolate-scabrous margins, tapering to each end, acute, slightly clasping; those of the filiform branchlets subulate; involucre clavate-turbinate, as long as the disk; the scales imbricated in numerous series, linear, obtuse, concave, herbaceous merely at the tips; achenia minutely puberulent-scabrous (under a lens).—*Lindl.! in Hook. compan. to bot. mag.* 1. *p.* 98, *& in DC. prodr.* 5. *p.* 244.

St. Louis, Missouri, *Drummond!* Louisiana, *Dr. Leavenworth!*—Stem apparently 2–3 feet high, often very much branched in a corymbose-paniculate manner; the branchlets rather numerous, lax, very slender, racemose or slightly paniculate, terminated by middle-sized heads. Lower leaves about 3 or 4 inches long, rather opaque, pale, sparingly reticulate-veined, or obscurely 3-nerved, tapering to an acute point, the margin upwardly almost

serrulate-scabrous; those of the branches and branchlets gradually reduced to subulate bracts resembling the exterior scales of the involucre. Rays about 20, elongated, blue or purple? Disk about 20-flowered. Achenia glabrous to the naked eye, but clothed with a very minute appressed pubescence under a lens. Pappus reddish-brown, not exceeding the innermost scales of the involucre.—A very distinct species, remarkable for its exactly turbinate involucre (5–6 lines long), which is very acute at the base, owing to the short exterior scales: these are coriaceous and white, with very short greenish tips.

* * * * * * * *Heads* (*middle-sized or small*) *paniculate or racemose: scales of the obovoid or campanulate involucre imbricated in several series* (*the exterior successively shorter*), *commonly appressed, chartaceous or somewhat membranaceous, with short green tips: achenia glabrous or slightly pubescent: radical and lowest cauline leaves* (*large*) *cordate, with elongated naked or margined petioles; the upper often petioled.*—Heterophylli, *Nees.*

† Leaves entire, undulate, or slightly serrate: heads loosely paniculate or racemose: rays usually bright blue or violet.

27. *A. azureus* (Lindl.): stem somewhat scabrous, racemose-compound at the summit; the branches slender and rigid; leaves scabrous; the radical and lowest cauline ovate-lanceolate or ovate-oblong, cordate, somewhat serrate, on long (naked or margined) often hairy petioles; the others lanceolate or linear, acute at each end, sessile, mostly entire; those of the spreading branches subulate, mostly very numerous and appressed; involucre broadly obconic, nearly the length of the disk; the scales closely imbricated, narrowly-oblong or linear, abruptly acute; achenia glabrous or very slightly and sparsely hairy.—*Lindl.! in Hook. compan. to bot. mag.* 1. *p.* 98, *& in DC. prodr.* 5. *p.* 244. A. Oolentangiensis, *Riddell! synops. fl. Western States*, *p.* 55.

Woods and prairies, of the Western States; from Western Louisiana, *Dr. Leavenworth! Dr. Hale!* Missouri, *Drummond!* Makato River (a tributary of St. Peter's), *Mr. Nicollet!* to Ohio, *Dr. Riddell! Dr. Paddock! Dr. Van Cleve!* and Fort Gratiot, Michigan, *Dr. Pitcher!* Also Georgia, *Dr. Chapman!* (a variety with more lax branches.) Aug.–Oct.—Stem 1–3 feet high, rigid. Heads equalling or sometimes exceeding those of A. undulatus in size; the involucre between hemispherical and turbinate, nearly as broad as long, and rather shorter than the pappus; the scales numerous, appressed, white except the green rhombic or triangular tips, slightly pubescent. Rays blue.—A well-marked species ("appearing as if a hybrid between A. rubricaulis and A. multiflorus," *Lindl.*, who described from imperfect specimens, wanting the lower leaves), manifestly connecting this group with the foregoing, with which it exactly accords in its involucre &c., remarkable for its scabrous leaves; the lower 3–5 inches long (sometimes hairy beneath); those of the branchlets reduced to short subulate bracts. The inflorescence usually consists of a few racemose rigid (although slender) branches, somewhat paniculate at the summit of the stem; but in some large specimens from Dr. Leavenworth, the stem is much racemose-compound, the rigid primary branches often more than a foot in length; and these, with the racemose branchlets, all terminated by single heads and clothed with uniform very short subulate leaves, so different from those of the stem, present a very marked appearance.

28. *A. Shortii* (Hook.): stem slender, nearly glabrous, racemose-paniculate at the summit; leaves glabrous and nearly smooth above, minutely pubescent beneath, lanceolate or ovate-lanceolate, tapering to a sharp point; the radical and cauline ones all more or less cordate and on naked (some-

what hairy) petioles, entire or sparingly serrate, the veins loosely reticulated beneath; those of the short pubescent branches small and sessile; heads numerous and rather crowded; involucre campanulate, shorter than the disk; the scales closely imbricated, lanceolate-linear, rather obtuse; achenia glabrous.—*Hook.!* (& *Lindl.!*) *fl. Bor.-Am.* 2. *p.* 9 (note); *Riddell! synops. l. c.*

Cliffs and banks of streams, throughout Kentucky, *Dr. Short!* &c. and Ohio, *Dr. Riddell! Mr. Sullivant! Dr. Paddock!* &c. Mountains of Georgia, *Mr. Buckley!* Arkansas, *Nuttall!* Sept.–Oct.—A beautiful species (deservedly dedicated to the well-known botanist who has so greatly contributed to our knowledge of the plants of the Western States), 2 to 4 feet high, remarkable for its lanceolate-cordate, petioled, often slightly falcate, rather membranaceous leaves; which vary from 3 to 5 inches in length, smooth and somewhat shining above, pale and puberulent (but scarcely, if at all scabrous) beneath; the lower ones often serrate or toothed towards the base; those of the branches oval or oblong, of the ultimate branchlets or peduncles minute and subulate. Heads showy (usually larger than in A. undulatus), racemose at the summit of the stem or on the short branches, often forming a thyrsus. Scales of the involucre appressed, minutely pubescent, whitish, with oblong green tips. Rays violet-blue, lanceolate: disk yellow, changing to purple. Pappus brownish or tawny.

29. *A. undulatus* (Linn., Ait.): pale with a close and cinereous often scabrous pubescence; stem paniculate or racemose-thyrsoid at the summit; leaves ovate or ovate-lanceolate, somewhat tomentose-pubescent beneath and scabrous above, acute, with the margins often undulate or slightly crenate-serrate; the radical and lowest cauline cordate, on slender slightly margined petioles, which are usually dilated and clasping at the base; the others abruptly contracted into a short broadly winged clasping petiole; the uppermost cordate-clasping; those of the branchlets lanceolate or subulate; involucre obovoid, nearly the length of the disk; the scales linear, mostly acute, pubescent, closely imbricated; achenia slightly pubescent, or at length glabrous.—*Linn. hort. Cliff. p.* 408, & *spec.* (*ed.* 1) 2. *p.* 875! (not of *ed.* 2.); *Ait. Kew.* (*ed.* 1) 3. *p.* 206; "*Hoffm. phytogr. bl. p.* 77. *t. C. f.* 1;" *Pursh, fl.* 2. *p.* 551; *Nees, Ast. p.* 57; *Darlingt.! fl. Cest. p.* 464. A. diversifolius, *Michx.! fl.* 2. *p.* 113; *Ell.! sk.* 2. *p.* 361; *Bigel.! fl. Bost. ed.* 2. *p.* 312; *DC.! prodr.* 5. *p.* 234. A. paniculatus, *Nutt.! gen.* 2. *p.* 156, not of *Ait.* A. sagittifolius & A. scaber, *Ell.! l. c.* A. patens, *Bart. compend. fl. Phil.* 2. *p.* 113. A. heterophyllus *γ. Nees, Ast. p.* 55? A. autumnalis & A. heteromallus, *Wender.*? ex *Nees.* (The leaves vary in size, from 1 to 3 or 4 inches; in shape from broadly ovate to nearly lanceolate, the radical often obtuse, the primordial roundish; and in pubescence, being sometimes minutely and softly tomentose on both surfaces, and frequently scabrous beneath as well as above.)

β. stem strict; panicle simple; the heads rather larger; cauline leaves elongated oblong or lanceolate.

Dry woodlands, nearly throughout the United States! *β.* Kentucky, *Dr. Short!* Sept.–Oct.—Stem 1–3 feet high, often purplish; the flower-branches spreading, rather rigid, with very small (often subulate) leaves. Radical and lower leaves remotely crenate or serrate, or, like the upper, merely undulate. Heads middle-sized, loosely disposed on the branches in a somewhat racemose manner, often unilateral, all pedicellate; or rarely somewhat glomerate. Scales of the involucre nearly membranaceous, with oblong or somewhat lanceolate green tips, acute or acuminate, ciliate. Rays pale violet-blue: disk yellow turning purple. Pappus becoming tawny or brownish.—That the var. *β.* is merely a peculiar state of this species, is evident from connecting specimens. The original A. undulatus (*Linn. hort. Cliff.!*) is not A. patens, but we believe belongs to this species, which must in any

case retain the name, as it is employed in the Hortus Kewensis, where the two species are first distinguished, anterior to Michaux.

30. *A. asperulus*: somewhat scabrous-pubescent; stem simple, racemose-paniculate at the summit; leaves sparingly and slightly serrate; the radical oblong-ovate, obtuse, mostly subcordate, on slender naked or margined petioles; the cauline oblong or spatulate, narrowed at the base, or the lowest on winged petioles, not dilated at the insertion, those of the branchlets minute, scattered; heads (small) loosely paniculate; scales of the somewhat hemispherical involucre oblong, acute, closely imbricated, shorter than the disk; achenia very minutely pubescent.

New Orleans, *Drummond!* Georgia, *Baldwin!*—Plant 1–2 feet high, pale with a close somewhat scabrous pubescence. Radical and lowest cauline leaves obtuse or slightly cordate at the base, on slender petioles; the others sessile, 1 to 3 inches long, mostly acute, somewhat serrate towards the apex, more or less scabrous above and pubescent beneath, tapering below, but not dilated at the base. Heads nearly as large as in A. undulatus; the scales of the involucre fewer, slightly pubescent, appressed, with rhomboid green tips. Rays blue or purple?

† † Lower leaves conspicuously serrate: heads usually small, racemose or somewhat thyrsoid: rays commonly pale blue.

31. *A. cordifolius* (Linn.): stem often flexuous below, racemose-paniculate at the summit; leaves glabrous, or often hairy beneath and slightly scabrous above; the radical and lower cauline cordate, acuminate, sharply serrate, on slender naked or margined and ciliate petioles; the uppermost ovate or lanceolate, sessile or with short margined petioles, often entire; heads numerous or somewhat crowded in oblong spreading or divaricate thyrsoid racemes or panicles; scales of the closely imbricated involucre oblong-linear, obtuse or rather acute, appressed, with short green tips; achenia glabrous.—*Linn. spec.* 2. *p.* 875 (& *hort. Cliff.*); *Ait. Kew.* (*ed.* 1) 3. *p.* 207; *Michx.! fl.* 2. *p.* 114; *Pursh! fl.* 2. *p.* 552; *Nutt.! gen.* 2. *p.* 156; *Ell.! sk.* 2. *p.* 364; *Lindl.! bot. reg. t.* 1597; *Bigel.! fl. Bost. ed.* 2. *p.* 313; *Darlingt.! fl. Cest. p.* 463. A. paniculatus, *Ait. Kew. l. c.*; *Pursh, l. c.* A. heterophyllus, *Willd. enum.* 2. *p.* 882. A. cordifolius, heterophyllus, & paniculatus (chiefly), *Nees, Ast. p.* 52 & 55; *Lindl.! in herb. DC., herb. Hook., & herb. Torr.*; *DC.! prodr.* 5. *p.* 233. A. pubescens, *Hornem. hort. Hafn. suppl.* 1. *p.* 98, fide *Nees.* A. latifolius autumnalis, *Cornut. Canad. p.* 64, *t.* 65. (Varies, with the stem glabrous, or pubescent in lines above, or roughish-hairy; the leaves broadly or narrowly ovate, either glabrous throughout, somewhat scabrous above, or hairy beneath; the branches of the panicle loosely or densely flowered.)

Woodlands, Canada! Northern and Western States! to the mountains of Georgia. Sept.–Nov.—Stem 1–4 feet high. Leaves membranaceous, or rather firm when growing in open situations, loosely veined, coarsely and sharply serrate, the radical and lower ones on slender narrowly margined ciliate petioles, 2–4 inches long; those of the branches small and frequently entire, reduced on the ultimate branchlets or peduncles to subulate bracts. Heads small, usually crowded in thyrsoid racemes on the rather short spreading or divaricate branches; the distinct peduncles also spreading. Scales of the involucre whitish, with green rather obtuse tips, often purple at the apex, minutely ciliate. Rays about 12, pale violet (or nearly white in shade) turning deeper; the disk changing to reddish-purple. The very numerous heads are smaller than in any of the preceding; the appressed involucre as in A. Shortii (except that it is much smaller), and the pale scales are tipped with short green points. We meet, however, with occasional specimens from the Western States, which, in their rather looser involucral scales

with somewhat longer and more acute green tips, make a near approach to A. sagittifolius *β.*; and we have observed the ordinary form of the species to assume a similar state, when cultivated for a few years in fertile soil and more open situations. Perhaps the A. paniculatus, *Ait.* was founded upon a plant of this kind. The A. cordifolius of the Northern and Middle States is a very uniform and well-marked species.

32. *A. sagittifolius* (Willd.): stem strict, glabrous, racemose-compound above; the branches ascending, rigid; leaves ovate-lanceolate, somewhat hirsute-pubescent or nearly glabrous, serrate, attenuate-acuminate; the radical and lower cauline elongated ovate-oblong, cordate at the base, on slender narrowly margined petioles; the others narrowed into a winged petiole; the uppermost lanceolate or nearly linear, acuminate at each end, sessile, often entire; heads numerous, in strict and dense compound racemes, on very short peduncles; scales of the cylindraceous involucre linear-subulate, appressed at the base, rather loose above; achenia glabrous.—*Willd. spec.* 3. *p.* 2035? *Nees, Ast. p.* 56? (*Lindl.! in herb. Hook.*); *Hook.! fl. Bor.-Am.* 2. *p.* 9; *DC. l. c.?* (not of *Ell.*) A. paniculatus, *Muhl.! herb.* (at least in part); *Ell. sk.* 2. *p.* 365; *Darlingt.! fl. Cest. p.* 464; not of *Nutt.*, nor of *Nees, &c.* A. urophyllus, *Lindl. in DC. l. c.?*

β. heads less crowded on the rigid branches; scales of the involucre lanceolate-subulate, or lanceolate with acute or acuminate tips; cauline leaves (varying from ovate to ovate-lanceolate) often nearly all cordate, thickish. (Varies, with the leaves, as well as the upper part of the stem, either almost glabrous, or scabrous-pubescent, or with the lower surface almost tomentose.)

Woodlands and low rich soil, Canada (Lake Huron, *Dr. Todd!* and Montreal, *Mr. Cleghorn!* in *herb. Hook.*) and on St. Peter's River, *Mr. Nicollet!* Western New York, *Dr. Sartwell!* and Pennsylvania! to Georgia! and Missouri! *β.* Western States, from Ohio! and Indiana! to Wisconsin! and St. Peter's River! Aug.–Oct.—Stem 2–4 feet high, branched above; the racemose (pubescent) flower-branches panicled, rather erect. Leaves slightly ciliate; the radical ones more or less cordate, or cordate-sagittate at the base (the sinus often closed), 2–5 inches long, and 1–2 broad, on petioles 2 to 6 inches in length; the upper cauline diminishing successively in size and width; those of the branches narrowly lanceolate and linear, reduced on the ultimate branchlets or peduncles to subulate bracts. Heads small (mostly larger than those of A. cordifolius), in crowded racemes, often almost sessile, or shorter than the bracteal leaves which subtend them. Scales of the involucre (as long as the disk) not very numerous, subulate from a rather broad pale appressed base to an acute point; the midrib and upper portion usually green. Rays about 12, narrow, purple or bluish, sometimes white; the disk yellow or turning purple.—This species is well characterised by both Elliott and Darlington, under the name of A. paniculatus. Possibly it is not the original A. sagittifolius; but, as it is certainly the plant of Hooker, and accords very well with Willdenow's description, and tolerably with that of Nees, it will perhaps be safe to retain the name, which is not inappropriate when applied to the radical leaves. It passes insensibly into our var. *β.*; which generally presents larger and more scattered heads, a somewhat turbinate involucre, with broader scales, which, however, always have slender pointed green tips; and the rays are sometimes bright blue: they are, as it were, intermediate between A. sagittifolius, A. cordifolius, and A. undulatus; but probably do not pass into the two latter.

33. *A. Drummondii* (Lindl.): stem and lower surface of the leaves canescent with a soft velvety pubescence; cauline leaves oblong-ovate, cordate, or crenate-serrate, tapering to an acute point, strigose or scabrous above, on margined petioles; the uppermost ovate-lanceolate and sessile; heads in strict and mostly dense thyrsoid racemes paniculate at the summit of the

stem; scales of the involucre subulate-linear; achenia minutely pubescent. —*Lindl.! in Hook. compan. to bot. mag.* 1. *p.* 97, *& in DC. prodr.* 5. *p.* 234.

St. Louis, Missouri, and also Texas, *Drummond!* Western Louisiana, *Dr. Leavenworth! Dr. Hale!*—Plant intermediate in its characters between A. undulatus, cordifolius, and sagittifolius, resembling some states of the former in its pubescence, the second somewhat in its petioled and mostly cordate cauline leaves, and the latter in inflorescence; but apparently distinct from either. Stem strict and rather stout, apparently 1 to 3 feet high, when old less canescent and more scabrous. Leaves serrate with appressed teeth, appearing somewhat crenate, velvety beneath; the lower ones 2 to 4 inches long, on narrowly margined petioles 1–3 inches in length. Heads as large as in the preceding, often nearly sessile and glomerate or crowded on the branchlets. Involucre pubescent. Rays blue; the disk turning purple. —We here introduce the two following species (known to us only by the very brief characters given in De Candolle), on account of their apparently close resemblance to this and the preceding species.

34. *A. urophyllus* (Lindl.): stem racemose-panicled, the branches thyrsoid; leaves ovate-lanceolate, very much acuminate, sharply crenate-serrate, very scabrous above, the lower surface hairy; scales of the imbricated involucre subulate. *Lindl. in DC. prodr.* 5. *p.* 233.

Louisiana.—Species near A. hirtellus. Rays white, longer than the involucre; the disk purple. *Lindl.*—Is it not A. sagittifolius, without the radical leaves? No information is given respecting the source from which the specimens of this and the following were derived.

35. *A. hirtellus* (Lindl.): stem racemose-panicled, the racemose branches crowded and few-leaved; leaves cordate-ovate, crenate-serrate in the middle, very scabrous above, the lower surface hairy; involucre loosely imbricated. *Lindl. in DC. prodr.* 5. *p.* 233.

Louisiana.—Rays perhaps lilac-color; the disk purple. *Lindl.*—We have from Western Louisiana (collected by Dr. Leavenworth) very imperfect specimens, which may perhaps be referred to this species, if indeed they are not rather a more glabrous and attenuated state of A. Drummondii, with loose and virgate racemes: the tall and slender stem is nearly glabrous; the branches scabrous-pubescent; the cauline leaves ovate-lanceolate, serrate in the middle, more or less cordate, on distinct margined petioles, strigose-scabrous above, pubescent beneath.

36. *A. Lindleyanus:* stem stout, glabrous, or pubescent in lines, corymbose-paniculate above; leaves (thickish) mostly smooth and glabrous, ovate, sharply and unequally serrate; the radical and lowest cauline usually somewhat cordate, on broadly margined petioles; the uppermost oblong-lanceolate, narrowed at the base, sessile; heads loosely-paniculate or somewhat corymbose; scales of the involucre linear-lanceolate, acute, somewhat unequal, rather loosely imbricated; achenia at length almost glabrous.—A. paniculatus δ.? (& *a.* chiefly) *Hook.! fl. Bor.-Am.* 2. *p.* 8.

β. stem and lower surface of the leaves (especially the midrib and petiole) pubescent with loose somewhat deciduous hairs.

γ. more slender; leaves membranaceous; the radical and lower cauline narrowed into a winged (ciliate) petiole.—A. præcox, *Lindl.! in Hook. fl. Bor.-Am.* 2. *p.* 9, not of *Willd.*

Saskatchawan, *Drummond!* and on the Red or Assiniboin River, *Douglas!* to Slave Lake, *Richardson!* β. Rocky Mountains (probably about lat. 52°), *Drummond!* γ. Fort Franklin on the Mackenzie River, *Richardson!*—Plant 2½ to 4 feet high, when growing in low fertile soils on the Assiniboin River, according to Douglas (in *herb. Hook.*); the Arctic specimens 12 to 18 inches high. Leaves thickish or somewhat fleshy, 1–3 inches long, mostly acute or acuminate, serrate with small and irregular

sharp spreading teeth; the lowest only cordate (and mostly slightly so), or often truncate at the base, on rather long margined or winged partly sheathing petioles, which when young are usually ciliate with soft hairs, but afterwards naked: upper cauline leaves ovate-lanceolate or oblong, acute or acuminate at each end. Flower branches erect, often nearly simple, and corymbose at the summit, leafy only at the divisions. Heads larger than in A. cordifolius or sagittifolius: rays about 20, blue or violet; the disk changing to purple. Scales of the involucre rather few, with slender linear-lanceolate green tips.—To this apparently well-marked and exclusively northern species we also refer the specimens of Douglas which are cited under A. sagittifolius in Hooker's Flora; which, like others from Saskatchawan, are larger than the Arctic plant, and with more numerous and rather smaller heads, but there is no other difference. In the latter, even the radical leaves are but slightly cordate or truncate at the base, and some of them frequently taper into the petiole; so that we find no adequate distinction between them and the A. præcox, *Lindl. in Hook.*, which was collected in the same region.

37. *A. ciliolatus* (Lindl.): stem simple (6–8 inches high); leaves all ovate, sharply serrate in the middle, ciliate, abruptly narrowed into a [margined] petiole, scabrous along the margins; heads axillary, sessile or on short pedicels, somewhat solitary; scales of the involucre erect, with membranaceous tips. *Lindl.! in Hook. fl. Bor.-Am. 2. p. 9, & in DC. prodr. 5. p. 235.*

Slave Lake, *Richardson!*—Dr. Lindley has remarked the close resemblance of this plant to his A. præcox (our A. Lindleyanus γ.), of which we greatly fear it is only a depauperate state. The heads are smaller, and in a specimen which bears 6 or 7 they are somewhat spicate or glomerate. Like the preceding, the margins of the young leaves and petioles are fringed with white hairs, which are usually deciduous when the leaves are fully developed; so that the name is not very appropriate.

* * * * * * * * *Heads (small and numerous) paniculate-racemose: scales of the campanulate or hemispherical involucre closely imbricated in several series, rigid, more or less unequal; the coriaceous whitish base appressed, with abrupt mostly squarrose or spreading herbaceous tips: achenia minutely pubescent: rays* (10–25) *white or pale purple: stems much branched or diffuse: cauline leaves rigid, sessile, linear, lanceolate, or subulate, entire; the radical and lowermost oblanceolate or spatulate, sometimes serrate.*—Ericoidei.

† Leaves tapering to each end, or narrowed at the base: scales of the involucre broadest at the base, with subulate or acute green tips.

38. *A. ericoides* (Linn.): glabrous or slightly hairy, racemose-compound; the simple branchlets or peduncles racemose and mostly unilateral on the virgate spreading branches; leaves rather rigid; the radical and lowest cauline oblanceolate or oblong-spatulate, tapering into a short margined petiole, often serrate; the others linear-lanceolate and linear-subulate, entire, acute at each end; scales of the hemispherical or often slightly turbinate involucre with acute or abruptly acuminate tips terminating the broader closely appressed lower portion; the outermost subulate from a very short base.—*Linn.! spec. 2. p. 875* (excl. syn. *Dill.*); *Ait. Kew.* (*ed.* 1) 3. *p.* 202; *Willd. spec.* 3. *p.* 2027; *Pursh! fl.* 2. *p.* 546; *Ell.! sk.* 2. *p.* 348; not of *Lam. & Michx.!* A. ericoides & A. glabellus, *Nees. Ast. p.* 107; *Lindl.! in herb. Hook. & herb Torr.*; *DC.! prodr.* 5. *p.* 242. A. sparsiflorus, *Michx.! fl.* 2. *p.* 242; *Willd. enum.* 2. *p.* 880, in part (also including specimens of A. coridifolius & A. tenuifolius, fide *Nees*). A. tenuifolius,

Willd. spec. 3. *p.* 2026 (excl. syn.); *Nutt.! gen.* 2. *p.* 155; *Darlingt.! fl. Cest. p.* 467. A. tenuifolius, & *β.* ericoides, *Muhl.! cat. p.* 77. A. dumosus, "*Hoffm. phytogr. bl.* 1. *t. A, f.* 2"; *Willd. enum.* 2. *p.* 880, & *herb.*, fide *Nees*; not of *Linn.* A. ramosissimus, A. leptophyllus? & A. subulatus? *Hort. Par.* fide *DC.*

β. villosus: stem and branches, and usually the leaves, villous-hirsute.—A. villosus, *Michx.! fl.* 2. *p.* 113. A. pilosus, *Willd.! spec.* 3. *p.* 2025; *Nees. Ast. p.* 109. A. glabellus, *Lindl.! in Hook. compan. to bot. mag.* 1. *p.* 97.

γ. platyphyllus: stem and mostly shorter branches densely villous; cauline leaves pubescent-hirsute, lanceolate; the lower ones oblong-spatulate; those of the branchlets only subulate-linear.

Barren soil, Canada and nearly throughout the United States! *β.* North Carolina! and Ohio! to Missouri! *γ.* N. Carolina, *Schweinitz! Mr. Curtis!* Indiana, *Dr. Clapp!* Aug.–Oct.—Stem 1–3 feet high, often branched from the base, bushy; the slender spreading branches, and the erect secund branchlets or peduncles, rigid. Leaves numerous, but not very crowded, rather rigid; the lower ones serrulate-ciliate, and often sparingly serrate, 2–4 inches long; the radical ones about the same length, oblanceolate; the primordial spatulate or obovate and much shorter; those of the upper part of the stem and branches varying from linear to subulate, an inch or less in length, acute, and pointed with a short bristle. Heads usually scattered along the branches, but sometimes rather crowded, 3–4 lines in diameter. Involucre rather shorter than the disk; two or three of the exterior scales similar to the subulate leaves of the branchlets, and like them cuspidate with a short bristle, either rather short and appressed, when the involucre appears slightly turbinate; or almost as long as the innermost, when it appears hemispherical; the inner scales glabrous or slightly ciliate, with rhomboid or triangular-lanceolate greenish tips, which are more or less spreading; the lower portion white, except the midrib, rigid and appressed, with membranaceous somewhat dilated margins. Rays 15–25, white or pale bluish-purple; the disk frequently turning reddish-purple. Achenia with a dense minute pubescence, turgid. Pappus of about 24 nearly equal serrulate-scabrous bristles, in a single series.—There is no difference between A. ericoides and A. glabellus, *Nees*, except a slight and variable degree of hairiness. Our var. *β.* is only a still more hairy state of the same species, with often wider leaves, which Nees (who examined an imperfect specimen in the herbarium of Willdenow), suspected to be the same as his A. glabellus. From this, we find a regular transition to our var. *γ.*, of which we have specimens with such broad cauline leaves (often half an inch wide by 2 to 3 inches in length), that no botanist would venture to unite them with A. ericoides without a very full suite of intermediate specimens. Perhaps the scales of the involucre are rather more equal; but we perceive no other difference.

† † Leaves crowded; the upper not narrowed, but usually dilated or partly clasping at the base: scales of the involucre spatulate, or narrowed below, mostly ciliate; the exterior with obtuse herbaceous tips.

39. *A. multiflorus* (Ait.): cinereous-pubescent or hairy; stem diffusely racemose-compound; the heads very numerous and crowded, somewhat unilateral; leaves linear, entire, closely sessile, not tapering at the base, with serrulate-scabrous or ciliate margins, spreading or at length recurved; scales of the campanulate involucre spatulate or linear-spatulate, with spreading or recurved tips; the exterior obtuse.—*Ait. Kew.* (*ed.* 1) 3. *p.* 203; *Willd. spec.* 3. *p.* 2027, & *enum.* 2. *p.* 880; *Pursh, fl.* 2. *p.* 546; *Ell.! sk.* 2. *p.* 349; *Nees. Ast. p.* 114; *Lindl.! in DC. prodr.* 5. *p* .243, & *in Hook.*

fl. Bor.-Am. 2. *p.* 13. A. ericoides dumosus, *Dill. Elth. t.* 36, *f.* 40. A. ericoides, *Lam. dict.* 1. *p.* 304; *Michx.! fl.* 2. *p.* 113. A. ericoides *var.* multiflorus, *Pers. syn.* 2. *p.* 443. A. ciliatus, *Muhl. in Willd. spec.* 3. *p.* 2027. A. dumosus, *DC.! prodr.* 5. *p.* 241 (as to spec. in herb., excl. char. & syn.); *Bigel. fl. Bost. ed.* 2. *p.* 311? (Varies, in the pubescence of the stem, leaves, and involucre, from hirsute-canescent to almost glabrous; in the scales of the involucre from spatulate and obtuse to nearly linear and acute, with the margins either strongly or slightly ciliate; and in the racemes, which are either dense and elongated, or more compound and thyrsoid; or, in sterile soil with few and scattered heads, sometimes even solitary and terminating the branches.)

β. stricticaulis: stem strict, slender, narrowly racemose at the summit, or slightly compound; heads (small) somewhat scattered; scales of the involucre mostly acute, more squarrose.—A. ericoides var., *Lindl.! in herb. Hook.* A. ericoides, *Hook.! fl. Bor.-Am.* 2. *p.* 12 (chiefly), excl. syn.

γ. commutatus: heads larger, fewer, solitary on the branches, or racemose-spicate.—A. ramulosus, *β.* incano-pilosus, *Lindl.! in Hook. fl. Bor.-Am.* 2. *p.* 13, *& in DC. l. c.* A. biennis, *Torr.! in ann. lyc. New York,* 2. *p.* 212; *Lindl.! in herb. Torr.*; not of *Nutt.*

Dry fields and sandy or gravelly soil, Canada, Massachusetts! and New York! to Georgia; and throughout the Western States from Michigan! to the Upper Missouri! *β.* Saskatchawan, and towards the Rocky Mountains, *Drummond!* *γ.* Upper Missouri, *Dr. James!* Rocky Mountains, *Drummond!* to Fort Franklin on the Mackenzie River, *Richardson!* Aug.–Nov. —Stem 1–2 feet high, much branched, very bushy; the branches mostly spreading, very leafy; the small heads usually crowded in dense racemes. Leaves 1-nerved, or somewhat 3-nerved by the confluence of the few veinlets, obtuse or scarcely acute, but usually tipped with a mucronate bristle; the cauline ones an inch to an inch and a half in length, 1–2 lines wide, often with tufts of smaller ones fascicled in their axils; those of the branchlets much smaller, crowded. Involucre 2 to 3 lines in diameter; the scales rather rigid, whitish and appressed, except the short spreading or recurved green tips, usually mucronulate like the leaves; the exterior shorter, more spatulate, and obtuse; the innermost linear, acute. Rays 10–15, broadly linear, white, or slightly tinged with purple; the disk-flowers about the same number, turning slightly purple. Achenia turgid, covered with a minute appressed pubescence.—The var. *β.* is a more attenuated plant, probably growing in shady places, with the leaves also more slender; certainly not a variety of A. ericoides. We have not seen the specimens from 'Red River, *Douglas*,' cited under that species in *Hook. fl. Bor.-Am.*, and know not whether they should be referred here.—The var. *γ.* does not differ from the ordinary A. multiflorus, except in the size and number of the heads, which are subject to considerable variation. It was a specimen of this plant (erroneously named A. biennis in *herb. Torr.*) that Dr. Lindley had in view, when he remarked the close affinity of his A. ramulosus *β.* with A. biennis *Nutt.* (A. canescens, *Pursh*). We have also a specimen of A. multiflorus *a.*, with more scattered heads, collected in Michigan, which Dr. Lindley has labelled 'A. canescens, *Pursh*': hence, probably, by some misapprehension, De Candolle, on his authority, has given Massachusetts as a habitat of that species; which, however, is not found east of the Mississippi.

40. *A. falcatus* (Lindl.): somewhat cinereous-pubescent with appressed hairs; stem strict, slender, racemose or somewhat compound at the summit; the heads solitary or several on the erect contracted branches; leaves linear, entire, minutely appressed-pubescent; the cauline partly clasping by a broad or somewhat dilated base, often slightly falcate, the margins scabrous; scales of the hemispherical involucre linear, somewhat narrowed below, all nearly equal in length, with spreading tips, mucronate-acute.—*Lindl.! in*

Hook.! fl. Bor.-Am. 2. *p.* 12, & *in DC. prodr.* 5. *p.* 241. A. ramulosus *a.*, *Lindl.! in Hook. l. c. p.* 13, & *in DC. l. c. p.* 243. A. bracteolatus, *Nutt. in trans. Amer. phil. soc. l. c.?*

Arctic America, from Fort Franklin on the Mackenzie River, to Cumberland House on the Saskatchawan, *Richardson!*—Stem 1–2 feet high. Leaves very numerous, 1½–2 inches long, 1-nerved or obscurely 3-nerved, usually broadest at the base, abruptly acute or obtuse, but tipped with a mucronate bristle. Heads in a simple or more or less compound narrow raceme, larger than the ordinary states of A. multiflorus; the scales of the nearly glabrous involucre more loose, equal, and acute.—The A. falcatus and the typical A. ramulosus of Lindley (from Fort Franklin and Cumberland House) appear to us entirely similar; and the affinity of the species is clearly with A. multiflorus.

41. *A. Nuttallii:* smooth and nearly glabrous; branches racemose, simple, rather naked, bearing solitary or few heads; leaves linear, rigid, entire, with scabrous margins; the upper sessile or somewhat clasping by a broad base; the radical and lowest cauline lanceolate, tapering into a petiole; scales of the involucre unequal, closely imbricated, linear-oblong, with short herbaceous tips; the exterior obtuse.—A. ramulosus, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 293, not of *Lindl.*

Plains of Lewis River, near the Rocky Mountains (about lat. 42°), *Nuttall!*—Plant 6–12 inches high, nearly glabrous to the naked eye; the branches mostly bearing single subglobose heads, of about the same size of those of A. ramulosus. Leaves coriaceous, acute; those of the branches few and small. Involucre hemispherical-campanulate, at length widely hemispherical, nearly glabrous; the scales appressed, obtuse or abruptly acute; the exterior successively shorter.—Allied to the preceding, but apparently quite distinct.

42. *A. campestris* (Nutt.): viscid-puberulent; cauline leaves oblong-linear, entire, mostly obtuse, closely sessile, slightly clasping; the radical ones oblanceolate, serrulate towards the summit, tapering into a petiole; heads racemose or slightly panicled; scales of the involucre lanceolate, very acute, viscid, rather loosely imbricated in about 3 series, somewhat spreading.—*Nutt.! in trans. Amer. phil. soc. l. c.*

"Plains of Lewis River, in the Rocky Mountain region: with A. ramulosus [A. Nuttallii], which it closely resembles, but differs in being every where somewhat pubescent and viscid, with a strong scent, &c. Stem about a foot high." *Nuttall!*—Heads as large as in the preceding. Involucre rather shorter than the ferruginous pappus. Ovary pubescent.

43. *A. bracteolatus* (Nutt.): stem pulverulently pubescent; leaves linear or oblong-linear, acute, sessile, entire; heads racemose-paniculate, mostly solitary on the leafy branches; involucre smooth, spreading; the scales oblong, somewhat acute; the outermost similar to the branch leaves.—*Nutt. in trans. Amer. phil. soc. l. c.*

"With the preceding, to which it is nearly allied, but remarkable by the smooth leaf-like involucrum. The radical leaves are unknown. Stem and branches more leafy than in the two preceding; the leaves nearly all similar. Flowers lilac-purple, rather large. *Nuttall.*—This species is unknown to us: we introduce it here on account of the resemblance it is said to bear to the preceding.

* * * * * * * * * *Heads* (*middle-sized or small*) *mostly racemose: scales of the involucre imbricated and unequal in length, membranaceo-herbaceous, with short appressed or somewhat spreading* (*not squarrose*) *greenish tips: achenia minutely pubescent or nearly glabrous: rays* (12–30) *usually pale or white, often small: stems at*

length much branched, racemose or paniculate, rarely corymbose: leaves serrate or entire (the radical spatulate, obovate, or oblong); the cauline sessile, usually tapering at the base.—Dumosi.

† Heads small: rays often short.

44. *A. racemosus* (Ell.): scabrous-pubescent; stem racemosely much branched; the heads spicate-racemose and mostly crowded towards the summit of the long and slender erect branches; leaves rather rigid, linear, sessile, entire, mucronulate, with minutely serrulate-scabrous margins; those of the branches short and scattered, spreading, linear-subulate or lanceolate; scales of the glabrous involucre subulate-linear, very acute, imbricated in 4 or 5 series, somewhat spreading, the innermost fully as long as the disk; rays very short.—*Ell.! sk.* 2. *p.* 348.

Damp or dry soil, Paris Island, South Carolina, *Elliott!* Florida, *Dr. Leavenworth!* Sept.-Oct. (*Ell.*)—Stem 2–3 feet high, erect, producing very numerous (rather strict? and mostly simple) slender virgate branches, along the upper part of which the small heads (scarcely as large as in A. multiflorus) are disposed, on peduncles 1 to 3 lines long, or seldom longer; forming either crowded or often loose spicate racemes, 3–5 inches long; the lower heads shorter than the leaves which subtend them. Lower leaves apparently 2–3 inches long, and 2–3 lines wide; those of the branches 4–2 lines long, with somewhat hispidly scabrous margins (under a lens). Scales of the involucre rather rigid, nearly glabrous, numerous; the exterior shorter; the innermost somewhat membranaceous, in the young state manifestly longer than the disk, spreading above. Rays very small, linear, pale purple, scarcely exserted beyond the disk or the involucre. Achenia minutely pubescent.—A very distinct species, which we have only seen from the sources mentioned above.

45. *A. Baldwinii:* scabrous-pubescent throughout, stem paniculate-compound; the heads solitary or loosely racemose on the branchlets; leaves rigid, closely sessile, partly clasping, entire, very scabrous above, mucronulate; the cauline ones oblong-linear; those of the branches and branchlets short, erect, oblong-lanceolate or ovate-subulate, acuminate-mucronate; scales of the involucre linear, acute, minutely pubescent, rather loosely imbricated in 3 or 4 series.

α. leaves appressed and crowded on the branchlets; scales of the involucre narrowly linear, very acute.

β. leaves more scattered on the branchlets; scales of the involucre broader, acute.—A. coridifolius, *Hook.! compan. to bot. mag.* 1. *p.* 97 (partly), not of *Michx.*

Dry soil? *α.* Georgia, *Baldwin!* (v. sp. in *herb. Schweinitz*, now *herb. acad. Philad.*; the specimens mixed with A. coridifolius and A. ericoides.) *β.* Jacksonville, Louisiana, *Drummond!* New Orleans, *Dr. Ingalls!*—Plant more closely allied to A. dumosus *β.* coridifolius than to any other species, nearly similar in habit, the size and disposition of the heads, &c.; differing, however, in its rough or even minutely hispid pubescence, more acute and cuspidate branch-leaves, and especially in the (fewer) acute scales of the involucre. It may also be compared (especially var *α.*) with the species of our section Brachyphylli), which it resembles in the short and nearly uniform upper leaves, which are mostly broadest at the base and partly clasping, and in the short rough pubescence; but the involucre, achenia, &c. are abundantly different. The fully developed branches of A. azureus (without the lower leaves) somewhat resemble var *β.* of this species; but they may be distinguished by their larger heads, with the scales of the turbinate involucre much more numerous, broader, and appressed, &c. The radical and lowest cauline leaves are unknown to us: those of the stem are an inch to an inch and a half long; those of the branches gradually reduced to one

or three lines. Scales of the involucre rather loose and spreading when old. Rays apparently blue or purple. Achénia slightly pubescent.

46. *A. dumosus* (Linn.): stem glabrous or slightly scabrous-pubescent, racemosely branched or decompound; the heads solitary at the extremity of the spreading branchlets, or rarely somewhat racemed; leaves linear, crowded, glabrous, with scabrous margins, sessile; the lower cauline ones linear-lanceolate, often remotely serrate with small and sharp appressed teeth; those of the branchlets small, mucronulate; scales of the involucre linear-spatulate, obtuse (or sometimes abruptly and slightly mucronulate), closely imbricated in 4–6 series, with short herbaceous tips.

a. verus: paniculate-racemose; the branchlets clothed with numerous linear-oblong and obtuse (obscurely mucronulate) small and spreading leaves; the upper cauline leaves frequently obtuse.—A. dumosus, *Linn.! hort. Cliff., & spec.* 2. *p.* 873 (excl. syn. *Gronov.?*); *Ait. Kew.* (*ed.* 1) 3. *p.* 202; *Bigel. fl. Bost. ed.* 2. *p.* 311; *Boott! in herb. Hook.* A. Americanus multiflorus, &c., *Pluk. alm. t.* 78, *f.* 6. A. fragilis, *Lindl.! in herb. Hook. &c.* partly, (*& bot. reg. t.* 1537?) A. sparsiflorus, *Nutt.! gen.* 2. *p.* 155, not of *Michx.*

β. coridifolius: racemose-compound or decompound; the slender and elongated diffuse branches and branchlets clothed with crowded, depauperate and bract-like, spreading or reflexed, rather obtuse, linear leaves; the lower cauline leaves linear, elongated, mostly entire.—A. coridifolius, *Michx.! fl.* 2. *p.* 112: *Willd. spec.* 3. *p.* 2028; *Pursh, fl.* 2. *p.* 547; *Nees, Ast. p.* 105; *Lindl.! bot. reg. t.* 1487, *& in herb. Hook. &c.*; *DC.! prodr.* 5. *p.* 241. A. foliolosus, *Ell.! sk.* 2. *p.* 345, probably not of *Ait.* A. foliolosus *β.* coridifolius, *Nutt.! gen.* 2. *p.* 155. A. sparsiflorus, *Willd. enum.* partly, ex *Nees.*

γ. subulæfolius: diffusely compound; leaves of the branches and branchlets rather subulate-linear, erect or slightly spreading; otherwise as in *β.*

δ. gracilentus: stem slender, rather sparingly branched; leaves scattered on the branchlets, very small, acute or obtuse; all usually entire.

ε. strictior: stem sparingly paniculate or racemose-compound; leaves usually more or less acute; the lower ones often slightly serrate; those of the short branchlets rather numerous, scarcely spreading; otherwise nearly as in *α.*—A. fragilis, *Lindl.! in herb. Torr. &c.*, partly.

ζ. subracemosus: stem racemose-compound; the heads often somewhat racemed; leaves mostly acute, the cauline ones frequently remotely serrulate; those of the branches more scattered, slender, and proportional, acute; scales of the involucre rather narrower, often slightly acute.—A. dumosus, *Nees, Ast. p.* 105, ex descr. A. foliolosus, *Ait. Kew.* (*ed.* 1) 3. *p.* 202? excl. syn. *Dill.?*

Dry or moist shady soil throughout the United States: *α.* Massachusetts! to Alabama! *β.* Throughout the Southern States! (mostly in pine woods.) *γ.* Texas, *Drummond!* Western Louisiana, *Dr. Leavenworth!* *δ.* Alabama, *Dr. Gates!* also in Georgia and Florida! *ε.* Vermont! and Michigan! to New Jersey! &c., usually in moist soil. *ζ.* Northern and Middle States! Aug.–Oct.—Stems 1–3 feet high. Lower leaves 2–3 inches long, 2–5 lines wide; those of the branches and branchlets reduced frequently to 2–3 lines in length, slightly rigid, with minutely ciliolate-scabrous margins. Heads usually about 4 lines in diameter, scattered: scales of the regularly imbricated involucre obtuse; the inner ones often mucronulate, about the length of the disk, slightly ciliate; the exterior successively shorter. Rays rather short (20–30), pale purple, occasionally almost white. Achenia minutely and sparsely pubescent under a lens.—The plants which we have here brought together (excepting the last enumerated variety, if such it be, which makes an approach to the following species,) accord in their inflorescence, achenia, scales of the involucre, &c.; while the foliage, in the vast number of specimens before us, presents almost every imaginable gradation between

the extreme forms. It is not unlikely that we have united two or more species; but, as we have sought in vain for any available distinctions, we are compelled to arrange the principal forms as varieties. The effects of cultivation, so far as our observation extends, appear to confirm the correctness of this view. Specimens of the form we have assumed as the type of the species have been compared with the Linnæan and Banksian herbaria by Dr. Boott, who considers them identical with the A. dumosus of Linnæus.

47. *A. Tradescanti* (Linn.): stem slender, often somewhat pubescent in lines, much branched; the (small) heads numerous, usually densely racemose on the erect-spreading or at length divergent virgate branches, often unilateral; leaves sessile, glabrous, with scabrous margins; the cauline ones lanceolate-linear, elongated, mucronate-acute or acuminate, remotely serrate in the middle with fine and sharp teeth; the upper and those of the branches successively shorter and usually entire, mucronulate; those of the branchlets oblong-linear, small; scales of the involucre narrowly linear, acute or acutish, imbricated in 3 or 4 series, appressed; the innermost rather shorter than the disk.—*Linn. hort. Cliff.* p. 408, *hort. Ups.* p. 262, & *spec.* 2. p. 876; *Michx.! fl.* 2. p. 115; *Pursh! fl.* 2. p. 556; *Ell. sk.* 2. p. 358; *Nees, Ast.* p. 103; *Lindl.! in herb. Torr.* (not in *herb. Hook.*); *DC. prodr.* 5. p. 241. A. Virginianus ramosissimus serotinus, parvis floribus albis, *Moris. hist.* 3. p. 121. A. vimineus, *Lam. dict.* 1. p. 306. A. recurvatus, *Pursh, fl.* 2. p. 556? *Nutt. gen.* 2. p. 158?

β. fragilis: cauline leaves, except the lowermost, minutely appressed-serrulate or entire, usually shorter; heads more scattered on the branchlets.—A. fragilis, *Willd. spec.* 3. p. 2051; *Nees. Ast.* p. 102; *Boott! mss. in herb. Hook.*; not of *Lindl., DC.* &c. A. multiflorus, *Nutt.! gen.* 2. p. 155, (excl. syn.) fide *herb.* A. tenuifolius, *Ell.! sk.* 2. p. 347, not of *Linn.*

Fields and along rivulets, in dry or rather moist soil, Massachusetts! to Ohio! Kentucky! and Louisiana! not uncommon. Aug.–Oct.—Stem 2–4 feet high, bushy; the branches very numerous, slender, racemosely arranged along the stem, or rarely somewhat corymbose or paniculate, at first often erect, but at length divergent or even divaricate, bearing very numerous heads on short pedicels, forming slender strict racemes, which decrease gradually in size upwards; in var. β. the racemes often more irregular, looser, and more paniculate. Lower cauline leaves 3 to 4 or 5 inches long, 3–4 lines wide, acute at each end, more or less evidently serrate with 4–8 sharp scattered teeth on each margin, which when rather large are somewhat spreading, but when minute are closely appressed; those of the branches and branchlets successively reduced in size. Heads smaller than in A. dumosus, about as large as is ordinary in the following species. Scales of the involucre fewer and narrower than in the former. Rays small, pale purple or almost white; the disk often turning purplish. Achenia closely and minutely pubescent.—While this species somewhat approaches narrow-leaved forms of the following; some states of var. β. having fewer, and consequently larger and more scattered heads, considerably resemble forms of A. dumosus, particularly the doubtful *var.* subracemosus, which should perhaps be referred to the present species.—A very different plant, with much larger heads, is frequently cultivated in the European gardens under the name of A. Tradescanti.

48. *A. miser* (Linn.? Ait.): stem mostly pubescent or hairy (often in lines), racemosely branched or compound; the numerous heads racemose along the spreading or divaricate branches; leaves lanceolate or oblong-lanceolate, sessile, attenuate or acuminate at each end, sharply serrate in the middle; the radical ones spatulate-lanceolate or oval, tapering into a petiole; those of the branches and branchlets successively smaller, and often entire; scales of the involucre linear, imbricated in 3 or 4 series (the exterior much

shorter, the innermost about the length of the disk), acute or rather obtuse; rays short, and often inconspicuous.—*Linn. spec.* 2. *p.* 887? (excl. syn. *Dill. Elth. t.* 35, *f.* 39.)* A. miser, divergens, diffusus, & pendulus, *Ait. Kew.* (*ed.* 1) 3. *p.* 205, and of most, if not all, succeeding authors.

α. miserrimus: stem and elliptical-lanceolate or cuneiform-lanceolate leaves more or less scabrous or pubescent; the flowering branches short, seldom divergent; scales of the involucre narrowly linear or linear-lanceolate, acute.—A. miser (excl. *γ.*), *Nees! Ast. p.* 111. A. miser, var. *Nutt.! herb.* A. myrtifolius, *Willd. enum. suppl.* fide, *Nees.*—The following are the chief variations: 1. Stem somewhat simple, puberulent-scabrous, as well as the leaves; heads glomerate or somewhat spicate on short racemed branchlets, which are often shorter, or sometimes longer than the leaves; in the latter case usually leafy.—2. Scabrous-puberulent; the flowering branches usually longer than the upper cauline leaves, bearing few or solitary heads. (A. miser, *Nees! in herb. Hook.* ex dono *Lindl.*)—3. Leaves scabrous above. the lower surface and the stem or branches softly cinereous-pubescent; heads somewhat secund and spicate on the (abbreviated or sometimes elongated) ascending flowering branchlets. (A. miser, var. *Nees.! in herb. Arn. & Hook.* Jacksonville, Louisiana, *Drummond!*)

β. glomerellus: mostly cinereous-pubescent or scabrous; leaves oblong-lanceolate, elliptical-lanceolate, or cuneiform-oblong, scabrous above, mostly short; heads glomerate-spicate at the summit of the stem or on divergent branches; scales of the involucre linear, obtusish or abruptly acute.—Varies: 1. Stem low (6–18 inches high), rigid, simple or with ascending branches; heads glomerate in short spikes at the summit of the stem or branches, and in the axils of the upper leaves, or on short spreading flowering branchlets; scales of the involucre rather broadly or spatulate-linear; the innermost sometimes narrower and more acute. (A. miser, *Nutt.! gen.* 2. *p.* 158; *Darlingt.! fl. Cest. p.* 466.)—2. Plant taller, less pubescent; heads (rather smaller) more loosely spicate along the slender or virgate divaricate branches; or the lower flowering branches somewhat compound. (A. diffusus, *Muhl.! in herb. Ell.*; *Nees, Ast.* (partly,) *and in herb. Arn. & Hook.!* St. Louis, *Drummond!*)

γ. diffusus: stem pubescent, or glabrous below, much branched; leaves nearly glabrous (mostly slightly scabrous above, sometimes sparsely pubescent beneath), lanceolate, oblong-lanceolate, or the lowermost often oblong-oval; branches diffuse, mostly elongated, divergent, recurved-spreading or divaricate; heads loosely or densely racemose; scales of the involucre linear, acute or acutish.—A. diffusus (partly?), divergens, pendulus, & parviflorus, *Nees, Ast. l. c.*; *DC. l. c.* A. divergens, *Nutt.! l. c.* A. parviflorus, *Darlingt.! fl. Cest. p.* 466. A. secundiflorus, & A. horizontalis, *Desf. cat. hort. Par.*—Varies in the disposition and length of the branches, in the number (and slightly in the size) of the heads, the size and breadth of the leaves, &c.: but the different forms are so connected that they are not clearly distinguishable into definite subvarieties. The cauline leaves vary from elongated lanceolate (3–5 inches, or in some specimens from Kentucky and Wisconsin even 6 inches long,) or the lowermost even broadly oval, to cuneiform-lanceolate, oval-lanceolate (2–3 inches long); the more or less

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* There are, if we mistake not, no specimens of A. miser in the Linnæan herbarium; and the description of Linnæus appears to have been drawn chiefly (but not entirely) from the 'Aster ericoides, Meliloti agrariæ umbone,' *Dill. Elth.* (A. foliolosus, *Ait.* q. v.) It is evident, however, from the phrase: "Radius albus, brevissimus et miser," that Linnæus had some other than the Dillenian plant in view, probably some form of the polymorphous species to which the name of A. miser has generally been applied by succeeding botanists; but this is by no means certain.

elongated primary branches are ascending or mostly divergent; the heads usually disposed along them on short pedicels, so as to form elongated leafy racemes, sometimes forming small glomerules, sometimes very numerous in spiciform divaricate racemes, or frequently more loose and somewhat paniculate, &c. Some of the narrow-leaved forms, with the midrib pubescent or hirsute beneath, pass into the following:

δ. *hirsuticaulis:* stem and midrib of the narrowly lanceolate elongated leaves more or less hirsute; heads racemose or spicate on short spreading or divergent branchlets; the uppermost in axillary glomerules much shorter than the leaves; scales of the involucre very narrowly linear, acute.—Varies: 1. Leaves nearly entire, but some of them remotely and very sharply serrate (4–5 inches long, attenuate-acuminate); the midrib very hirsute beneath; heads few, in racemes much shorter than the leaves. (A. hirsuticaulis, *Lindl.! in DC. prodr.* 5. *p.* 242, ex *herb. Torr.* Albany, New York, *Beck!*)—2. Stem sparingly hirsute-pubescent; the midrib of the (mostly entire) leaves glabrous or nearly so; heads few and glomerate on branchlets usually much shorter than the leaves; the uppermost in small sessile glomerules; otherwise as in no. 1. (Bellows Falls, Vermont, *Mr. Carey!*)—3. Leaves narrowly lanceolate, attenuate-acuminate (3–4 inches long), mostly serrate with sharp scattered teeth; the midrib beneath and stem hirsute; heads in short recurved-spreading somewhat leafy spikes; the upper in sessile glomerules. (Wayne County, New York, *Dr. Sartwell!*)

Old fields, borders of thickets &c., Canada! and throughout the United States! common. Aug.–Oct.—A polymorphous species, 10 inches to 3 feet high, erect or diffuse, often beginning to flower when nearly simple, but at length usually much branched, varying greatly according to soil, situation, and age. Heads small, often very numerous; the involucre nearly glabrous, the scales with short green tips. Rays white or tinged with purple, short, often inconspicuous: the corolla of the disk often turning purple; the limb deeply 5-parted. Achenia minutely pubescent.—This is the most polymorphous species of the genus. It would be easy to arrange its most remarkable forms as distinct species, but perfectly impossible to characterize them. Even our var. diffusus might thus be divided into a dozen species of equal consequence with those admitted by later authors. Its most striking states are, 1. a Western plant with lower leaves six inches long, and the heads also larger than usual: 2. a form which we have only received from N. Carolina, with nearly simple stems and inflorescence, and small broadly oval, or cuneiform-oblong leaves: the latter is sometimes called A. Cornuti.

49. *A. Lamarckianus* (Nees): stem pubescent in lines, racemose-decompound, coarctate; the branches paniculate-racemose; leaves lanceolate, acuminate, sessile, appressed-serrate, scabrous above; those of the branchlets lanceolate-acuminate, spreading; scales of the involucre linear, rather equal, loosely imbricated. *Nees, Ast. p.* 100; *Lindl.! in Hook. fl. Bor.-Am.* 2. *p.* 11; *DC. prodr.* 5. *p.* 241. A. paniculatus, *Lam. dict.* 1. *p.* 306 (not of *Ait.*), fide *Nees.* A. Tradescanti, *Nees, synops. p.* 28. A. parviflorus, *Lindl. in Hook. fl. Bor.-Am. l. c.?*

Canada, according to Lamarck, *Nees.* Saskatchawan, *Richardson! Drummond!* (v. sp. in *herb. Hook.*)—According to Nees, this species is quite different from any with which he is acquainted, except his A. divergens. The plant from Saskatchawan appears nearly to agree with an immature specimen of the species cultivated in the Berlin botanic garden, under this name.

†† Heads middle-sized.

50. *A. simplex* (Willd.): stem glabrous, racemose-decompound; the branches somewhat corymbose at the summit; the branchlets contracted, bearing few [middle-sized] heads; leaves lanceolate, acuminate, very smobth,

the margins scabrous; the lower serrate; scales of the involucre loosely imbricated, linear-subulate. *Nees.—Willd. enum.* 2. *p.* 887; *Nees, Ast. p.* 91; *DC. prodr.* 5. *p.* 239. A. lanceolatus, *Willd. spec.* 3. *p.* 2050? (a species of doubtful origin, perhaps not American), and of North American authors? A. salicifolius, *Darlingt.! fl. Cest. p.* 467; not of *Ait.?* A. æstivus, *Ait.? Willd.?*

β. stem diffusely branched; the branches pubescent in lines, often elongated and diverging; heads (variable but mostly rather large) racemose-scattered; scales of the involucre linear, acute, (rays blue or nearly white).—A. recurvatus, *Nees, Ast. p.* 93? A. Novi-Belgii *var.* minor, *Boott! in herb. Hook.* A. divergens (partly), *Lindl.! in herb. Hook.* A. obliquus (partly), *Lindl. in herb. Hook.*

γ. heads (middle-sized) in dense or contracted axillary racemes which are shorter than the cauline leaves; otherwise as in *β.*

δ. stem tall (4–6 feet high) erect; the branches hirsute or pubescent, often in lines; heads (pretty large) loosely racemose or somewhat paniculate towards the extremity of the branchlets; rays blue.

ε. stem 1–2 feet high, pubescent in lines above; heads numerous or crowded on the short branchlets, small; rays pale blue or bluish-white.

Wet banks of streams and margins of swamps, Canada! and nearly throughout the United States! *a. δ.* & *ε.* Common in the Northern and Middle States! *β.* Ohio! Kentucky! &c. common. *γ.* Ohio, *Mr. Lea!* Aug.–Oct.—A polymorphous and widely diffused species (not happily named A. simplex), much resembling the A. salignus of Europe, as Nees remarks, particularly the larger-flowered forms. Probably some species founded on plants long cultivated in European gardens have been derived from it; and perhaps A. obliquus, *Nees*, is among the number. Some states are, moreover, very near our A. tenuifolius *γ.* bellidiflorus; and our var. *ε.* closely approaches A. Tradescanti, but has larger heads, and broader as well as more deeply serrated lower leaves.—The leaves are 1 to 4 inches long, 3–10 lines wide, tapering to an acuminate point, glabrous and smooth on both sides, or the upper surface scabrous towards the margins, which are ciliolate-scabrous; the lower serrate in the middle with small and sharp or mucronate teeth, narrowed to the base, sessile or slightly clasping; the uppermost and those of the branches mostly entire. Scales of the obovoid involucre more or less unequal, loosely imbricated, narrow, acute; the tips often a little spreading. Disk flowers at length turning brownish or purplish. Achenia minutely pubescent.

51. *A. tenuifolius* (Linn.): nearly glabrous; stem paniculate-compound, or the branchlets and (rather small) heads often slightly racemose; leaves narrowly lanceolate or lanceolate-linear, mostly elongated, attenuate-acuminate, the margin scabrous; the lower ones usually sharply serrate in the middle; those of the branches and branchlets entire, attenuate, proportioned; scales of the hemispherical involucre numerous, linear or subulate-linear, acute, closely imbricated, or the points somewhat spreading, the innermost nearly as long as the disk; rays rather short.—*Linn. spec.* 2. *p.* 873 (at least as to syn. *Pluk.*); *Nees, Ast. p.* 119; *DC.! prodr.* 5. *p.* 245. A. Americanus Belvidere foliis, &c. *Pluk. alm. p.* 56, *t.* 78, *f.* 5. A. polyphyllus, *Willd. enum.* 2. *p.* 888, fide *Nees.* A. junceus, *Pursh, fl.* 2. *p.* 557; (*Ell. sk.* 2. *p.* 356?) *Nees, synops. p.* 26, fide *Nees.* A. Tradescanti (partly), *Lindl.! in herb. Hook.*

β. ramosissimus: paniculately much branched; the branches and branchlets rigid, somewhat erect, roughish-pubescent; leaves often scabrous; scales of the involucre more closely imbricated and numerous, linear-subulate.—A. tenuifolius, (*Linn. l. c.?*) *Lindl.! in herb. Hook.* A. tenuifolius *γ. Nees, Ast. p.* 120.

γ. bellidiflorus: paniculate-compound, rather strict; the branchlets and

heads often somewhat racemose; leaves smooth, or frequently scabrous above; scales of the involucre narrowly linear, acute, loosely imbricated.—A. bellidiflorus, *Willd. enum.* 2. *p.* 886; *Nees, Ast. p.* 97; *DC. prodr.* 5. *p.* 240; *Lindl.! in Hook. fl. Bor.-Am.* 2. *p.* 11. A. angustus & rigidulus, *Nees, synops. p.* 26, & *p.* 29.—Varies: 1. Leaves narrowly lanceolate or linear, elongated, nearly entire: 2. Leaves shorter and usually entire; heads smaller. (A. dracunculoides, *Willd. spec.* 3. *p.* 2050, & *enum. l. c.*, fide *Nees.* (v. sp. *hort. Berol.*) A. leucanthemos, "*Desf. cat. hort. Par. ed.* 3. *p.* 401"; *Nees, Ast. p.* 95; *DC. l. c.*; not of *Raf.* A. bellidiflorus, *Nees, synops. p.* 21. A. artemisiæflorus, *Poir. suppl.* 1. *p.* 500.): 3. Lower leaves rather broadly lanceolate, sharply and often coarsely serrate, or sometimes nearly entire.

Low or moist soil, Canada (γ. from the Saskatchawan!) and Northern States! to the upper districts of N. Carolina. Aug.–Oct.—Stem 2–4 feet high, usually rather stout and rigid; the branches often pubescent, especially in lines. Cauline leaves varying from 2½ to 5 or even 6 inches in length (those of the branches very gradually reduced in size), narrowed at the base, tapering above to a long attenuate very sharp point, scabrous-ciliolate under a lens, of a rather firm texture, with a strong midrib, the veinlets copiously and conspicuously reticulated beneath. Heads about middle-sized (larger than in A. miser); the scales of the involucre acute or acuminate, somewhat ciliate; the exterior often greenish throughout, the others with short green tips. Rays numerous, considerably longer than the disk (which sometimes turns purplish), pale purple or nearly white, usually assuming a deeper tint before fading.

52. *A. carneus* (Nees): glabrous, or the strict racemose branches somewhat pubescent in lines; leaves uniform, entire or nearly so, narrowly lanceolate, mucronate-acuminate, slightly scabrous above, with serrulate-scabrous margins; the lower more or less attenuate towards the base; the upper shorter and partly clasping; heads (middle-sized) racemose towards the summit of the leafy branches; involucre obovate, manifestly shorter than the disk; the scales unequal, lanceolate, abruptly acute, closely imbricated; rays rather large.—*Nees, synops. p.* 26, & *Ast. p.* 96; *Lindl.! in herb. Hook.* A. laxifolius γ. carneus, *Lindl. in DC. prodr.* 5. *p.* 236. A. obliquus, *DC.! prodr.* 5. *p.* 237, partly.—Varies, with the heads few and nearly sessile, on short leafy branches, which are aggregated in a compact raceme. (A. salicifolius, *Muhl.! in herb. Ell.*, partly.)

β. *subasper:* racemosely much branched; the branches usually very numerous, rather strict and rigid, puberulent, bearing numerous densely racemose heads; leaves minutely scabrous above; those of the branches shorter, oblong-linear or lanceolate.—A. subasper, *Lindl.! in Hook. compan. to bot. mag.* 1. *p.* 97, & *in DC. prodr.* 5. *p.* 237.—Varies: 1. Exterior scales of the involucre somewhat spatulate-linear, obtuse or abruptly and very slightly acute: 2. Stem densely racemose-compound at the summit; leaves of the branches and branchlets very short. (Louisiana, *Dr. Leavenworth!*) A state of the plant with short leaves and smaller heads scattered along the slender branches connects it with our var. γ.

γ. *ambiguus:* heads racemose along the branches, somewhat scattered, on short peduncles; involucre conspicuously shorter than the disk; cauline leaves elongated, rather broadly lanceolate, much attenuate at each end, sometimes sharply serrate in the middle; those of the branches nearly as in var. α.

Moist soil, Massachusetts, (near Boston, *Dr. Boott!*) to Pennsylvania, *Muhlenberg! Schweinitz!* and Ohio, *Dr. Riddell! Mr. Sullivant!* β. St. Louis, Missouri, *Drummond!* Indiana, *Dr. Clapp!* Louisiana, *Dr. Leavenworth!* γ. Ohio, *Dr. Paddock!* Sept.–Oct.—Cauline leaves (numerous) usually 2 to 3 or 4 inches long, of the same firm texture as in the preceding,

and with the veinlets similarly reticulated; the apex more abruptly narrowed to a mucronate-acuminate point; those of the branches 1–2 inches long, usually broader in proportion to their length, those of the branchlets often very short. Heads usually larger than in A. tenuifolius, but somewhat variable in this respect; the scales of the involucre broader and shorter, appressed (or the outermost loose), more unequal, and regularly imbricated, pale, with short usually rhombic-ovoid green tips, which are very slightly spreading. Rays longer, broader, and more showy than in A. tenuifolius, 'flesh-colored' (*Nees*), nearly white, or sometimes light violet-purple in the wild plant; the disk often turning purplish. Alveoli of the receptacle somewhat lacerate or laciniate.—This species was described by Nees, from specimens of uncertain derivation, cultivated in the garden of Count Schœnborn. Dr. Lindley identified a plant collected near Boston by Dr. Boott, with an authentic specimen, from Nees. We have the same plant from Ohio, and other specimens, which clearly show that A. subasper of Lindley is only a form of this species. Although apparently distinct from both, it closely approaches A. laxifolius on the one hand, and A. tenuifolius (with which Nees compares it) on the other. Some states of it have not unfrequently been labelled A. Tradescanti; a name often applied to what we consider a form of A. tenuifolius.

53. *A. Greenei:* stem smooth and glabrous, racemosely branched or compound; leaves nearly all remotely appressed-serrulate, glabrous, acute or acuminate, scabrous above; the cauline ones narrowly lanceolate, elongated, slightly clasping (not dilated) at the base; those of the branches short, numerous, ovate-lanceolate or oblong, somewhat clasping at the base, spreading; heads (hardly middle-sized) simply racemose on the leafy branches, on very short bracteate peduncles; involucre campanulate, somewhat shorter than the disk; the scales linear-lanceolate, acute, rather closely imbricated in nearly 3 series, the exterior somewhat shorter.

Near Boston, *Dr. B. D. Greene! Dr. Pickering!* (in *herb. acad. Philad.*) —The specimens we have seen want the lower cauline leaves, and do not afford sufficient information as to the size of the plant. The cauline leaves in the specimens are 3–5 inches long, about half an inch broad, remotely serrate with minute teeth, of a rather firm texture; the veinlets of the lower surface finely reticulated, but less conspicuously than in A. carneus; the upper surface very scabrous in one specimen, but slightly so in the other: the leaves of the branches are pretty uniform throughout in size and shape, 6–12 lines long, lanceolate-ovate or elliptical, nearly all serrate like those of the stem. Heads nearly the size of those of A. carneus *β.* subasper, racemose or sometimes crowded along the slender ascending branches in a similar manner; the lower often shorter than the leaves from the axils of which they rise. Scales of the involucre rather appressed, pale below, with a greenish mid-nerve, more lax than in A. carneus, and with narrower and sharper herbaceous tips. Rays rather short, broadly linear, apparently purplish; the disk turning to reddish-purple. Achenia minutely puberulent.

* * * * * * * * * * * *Heads (middle-sized or large, showy) mostly corymbose or paniculate: scales of the involucre equal or somewhat unequal, more or less imbricated, with lax or spreading herbaceous or foliaceous tips; the exterior frequently entirely herbaceous: achenia pubescent or glabrous: rays usually large and numerous, blue or purple: cauline leaves sessile, the upper more or less clasping.*—Salicifolii.

† Scales of the involucre erect or appressed, with mostly short (seldom squarrose) herbaceous tips; the exterior often entirely herbaceous.

54. *A. laxus* (Willd.): stem glabrous, racemose-compound or decompound; the branches loose and corymbose at the summit; the branchlets

elongated; leaves narrowly lanceolate, acuminate, the margin (and often the upper surface) scabrous; the lower ones somewhat serrate; those of the branchlets linear, obliquely spreading; scales of the involucre in the terminal heads loose, and nearly equal, linear; of the others imbricated, reflexed at the summit. *Nees.—Willd. enum.* 2. *p.* 886; (*Pursh, fl.* 2. *p.* 557?) *Nees, Ast. p.* 95; *DC. prodr.* 5. *p.* 240.

North America, *Willdenow.* (Low sandy fields, New Jersey to Virginia, *Pursh*; who, however, probably had a different species in view.) Near Boston, *Dr. Boott! Dr. Greene!* in *herb. Hook.*) New York, *Mr. Browne!* Sept.-Oct.—The few specimens we have seen agree very well with the character of Willdenow, and that of Nees, which we have copied. They belong to a good-sized plant, with very numerous and rigid ascending (racemose) branches, which terminate in loose corymbs. The cauline leaves (3–5 inches long and 4–5 lines broad) are rather rigid, serrulate with scattered appressed teeth, the upper surface more or less scabrous; the uppermost and those of the branches short, partly clasping and sometimes slightly dilated at the base. The heads are rather smaller than in A. prælatus, but very similar, except that those which terminate the leafy branchlets present a much more foliaceous involucre; the numerous exterior scales being entirely herbaceous, thickish, broadly linear, obtuse or mucronate-acute, often as long as the disk, loose, at length squarrose-spreading; the outermost similar to the leaves of the branchlets: in the lateral heads, when these are produced, the scales are regularly imbricated, as in A. prælatus. The rays appear to be purplish-blue. Although he has placed the two species at some distance from each other, Nees appears to suspect that his A. laxus may pass into A. prælatus; which is most probably the case. Indeed these two species, as well as A. elodes and A. Novi-Belgii, seem to be connected by a series of intermediate forms.

55. *A. prælatus* (Poir.): stem or branches mostly hairy in lines, racemose-paniculate or corymbose at the summit; leaves lanceolate, partly clasping, acute, entire, or obscurely appressed-serrate, glabrous, with scabrous margins, the upper surface somewhat shining, smooth, or slightly scabrous towards the apex and margins; the lower narrowed towards the base; scales of the involucre unequal, loosely imbricated in 3 or 4 series, linear-lanceolate, acute, often with the tips spreading; rays rather large.—*Poir. suppl.* 1. *p.* 493; *Nees, Ast. p.* 71; *DC. prodr.* 5. *p.* 236. A. salicifolius, *Ait. Kew.* (*ed.* 1) 3. *p.* 203? (*Pursh, fl.* 2. *p.* 549?); *Bigel. fl. Bost. ed.* 2. *p.* 309. A. virgatus, *Nees, synops. p.* 27.

Moist woods and rocky banks of streams, New Hampshire! Massachusetts! and perhaps throughout the Northern States. Aug.-Oct.—Stem 1 to 5 or 6 feet high, often rather slender and flexuous, frequently hairy or pubescent throughout when young, at length smooth and glabrous except in lines, often purple, branched near the summit; the branches somewhat racemose or racemose-compound, rather rigid; the branchlets short, and usually forming a more or less fastigiate or thyrsoid-corymbose inflorescence. Radical or primordial leaves spatulate-oblong, 1–2 inches long, obtuse, nearly entire, tapering into a somewhat ciliate margined short petiole, sheathing at the base; all the lower ones often hairy on the midrib when young. Cauline leaves about 4 inches long, 5–8 lines wide, tapering gradually to an acute point, of a firm texture, pale and very smooth beneath, with a narrow prominent midrib, bright green above, usually a little scabrous only towards the summit; the veins forming loose open reticulations, which are rather conspicuous in the older leaves; the upper usually with a more or less dilated or auriculate insertion. Heads rather large and showy. Involucre as long as the disk; the scales numerous, pale and often somewhat narrowed towards the base, slightly ciliate, herbaceous above, mostly with slight membranaceous margins. Rays violet or pale blue, pretty large in the wild

plant (the ligule as long as the involucre); the disk-flowers often changing to purple. Achenia minutely pubescent, or glabrous when old.—We should have restored the older name of A. salicifolius, were we at all confident that it belongs to this species: as this is doubtful, we have followed Nees and De Candolle. Pursh's plant is said to grow from New York to Virginia.

56. *A. elodes:* very smooth and glabrous; stem mostly simple, corymbose or rarely somewhat racemose-paniculate at the summit; leaves linear-lanceolate, fleshy, acute or acuminate at each end, entire or sparingly appressed-serrulate, shining, reticulate-veined, the upper surface often minutely scabrous towards the apex and margins; the uppermost partly clasping by a more or less narrowed base; scales of the obovoid involucre rather closely imbricated in 3 or 4 unequal series, linear or spatulate-linear, mucronulate-acute; the exterior often with recurved-spreading herbaceous tips; the innermost erect, as long as the disk; rays large; achenia glabrous.—A. paludosus, *Nutt. gen.* 2. *p.* 155*?*

β. leaves varying from narrowly lanceolate to broadly oval-lanceolate, or the lowermost lanceolate-spatulate.

Wet swamps, mostly in pine barrens, Massachusetts! Long Island! New Jersey! and Pennsylvania! to Virginia! and North Carolina! Aug.–Sept. —Stem usually simple, and 1 to 2 feet high, very smooth, mostly purple; the branches sometimes slightly pubescent. Leaves sparse, 3–5 inches long, usually from 2–4 lines wide, but varying from half to three-fourths of an inch wide (when they are commonly shorter in proportion and more or less acuminate at each end), mostly deep green and shining above, and conspicuously reticulated with impressed veins, the margins often slightly and sharply serrate; those of the branches small, spreading. Heads large and showy, few or rather numerous, in simple or somewhat compound corymbs, or sometimes paniculate racemes, solitary on the short and rather rigid, sparse and diverging branchlets. Involucre glabrous or slightly pubescent; the scales of a rather firm texture; the exterior herbaceous, except the pale broad margins near the base; the others with oblong-lanceolate herbaceous tips, which are sometimes erect, but usually more or less spreading or squarrose; the innermost more membranaceous, often with purple tips. Rays large, numerous, deep blue or violet; the disk flowers sometimes turning purplish. Achenia minutely and slightly pubescent when very young, smooth and glabrous when mature.—This is a common species in the swamps of the pine barrens of New Jersey, and is found in similar situations as far north as Massachusetts, and as far south at least as North Carolina. It varies much in the form of the leaves, which are frequently as narrow as in A. paludosus, but sometimes as wide as in A. Novi-Belgii. It begins to flower when only 8 or 12 inches high, and perhaps seldom attains more than two feet in height; while the heads are proportionally large and showy. We are not sure that it has been described by any author, either in Europe or this country; but it has probably been confounded with A. præaltus or A. Novi-Belgii, to both of which its different forms so closely approach as to render the diagnosis difficult. It can hardly be the A. brumalis of Nees (which is described from spontaneous German specimens, supposed to be of American origin), and is by no means a late-flowering species.

57. *A. Novi-Belgii* (Linn.): smooth and glabrous throughout (or the branches slightly pubescent in lines), often somewhat glaucous; stem stout; the branches strict, racemose or somewhat corymbose; leaves rigid or slightly coriaceous, pale and very smooth, or slightly scabrous towards the margins of the upper surface, lanceolate or oblong-lanceolate, somewhat serrate, tapering to each end, acute; the lower partly clasping by the narrowed base; the uppermost and those of the branches short, clasping by a broader base, often entire; involucre (hemispherical) about the length of the disk; the scales

lanceolate, somewhat unequal, rather closely imbricated in about 3 series, with broadish acute herbaceous tips; rays numerous, mostly large.—*Linn.! hort. Cliff. p.* 108, *& spec.* 2. *p.* 877; *Ait. Kew.* (*ed.* 1) 3. *p.* 206; *Pursh, fl.* 2. *p.* 554; *Nees! Ast. p.* 79; *DC.! prodr.* 5. *p.* 238, (excl. syn. A. floribundus, *Nutt.*) A. Novi-Belgii latifolius, &c. *Herm. Lugd. p.* 66, *t.* 69. A. serotinus, *Willd. spec.* 3. *p.* 2049 (partly), fide *Nees.* A. lævigatus, *Pursh, fl.* 2. *p.* 553?—The following varieties are enumerated by Nees, all described from garden specimens: Var. *a. ampliflorus;* the original species, as characterized above, (branches simply racemose, the large heads somewhat corymbose; ray ample, &c.) Var. *β. squarrosus:* leaves lanceolate, rather more elongated; branches simply racemose, with the heads somewhat corymbose; ray broad and dense; scales of the involucre somewhat equal, the exterior squarrose-spreading, often foliaceous and elongated. (A. junceus, recurvatus, and adulterinus, of some gardens). Var. *γ. serus:* stem taller; ray dense, flesh-colored, whitish towards the disk. Var. *δ. minor:* leaves lanceolate, attenuate; the branches crowded, dichotomous-corymbose, many-flowered; ray shorter and not so dense; scales of the involucre loosely imbricated, unequal; flowers smaller; stem lower. (A. floribundus, *Willd. spec.* 3. *p.* 2048, *& enum.* 2. *p.* 885, &c.)—The indigenous plant varies: 1. Heads (ample) solitary or nearly so on short axillary branchlets, often much shorter than the leaves.—2. Heads (rather large) in clusters or short crowded racemes at the summit of axillary branches, which are either shorter or longer than the cauline leaves, racemose along the stem or aggregated and somewhat corymbose at the summit.—3. Heads (smaller), racemose or racemose-paniculate towards the summit of numerous slender branches, which are racemose along the stem, the upper fastigiate; scales of the involucre narrower; ray shorter.

Borders of swamps and moist ground, from near the sources of the Mississippi (Banks of Spirit Lake, *Mr. Nicollet!*) to S. Carolina, *Elliott!* (A. lævis? *Herb. Ell.!*) and Georgia, *Miss Clay!* apparently not very common. Sept.–Oct.—Stem usually stout, 1–4 feet high. Leaves thickish; the lower ones often 5–6 inches long, and about an inch wide, often tapering from above the middle to the base, with a pretty strong midrib, the margins scabrous; the primary veins few; the reticulation of the veinlets rather obscure. Heads, when not very numerous, frequently an inch in diameter; including the rather linear and pretty large pale blue rays, but sometimes reduced to half that size. Exterior scales of the involucre occasionally herbaceous throughout; the others pale at the base; the short herbaceous tips also with slight pale or scarious margins. Disk often turning purplish. Achenia slightly pubescent.—Our plant, which wholly accords with the description of A. Novi-Belgii, *a. Nees*, is doubtless the same with the original Linnæan species, and with that figured by Hermann. Although extensively diffused, it appears to be uncommon in this country. It has been cultivated in Europe for more than a century and a half; and from it several nominal species have probably been derived.—The "specimen of an Aster from Dr. Scouler, gathered on the Columbia, which Prof. Lindley inclines to refer to A. asper," (*Hook. fl. Bor.-Am.* 2. *p.* 10, under A. luxurians,) is either a variety of A. Novi-Belgii, or belongs to a new species, of which there are not sufficient materials for description.

58. *A. amplus* (Lindl.): stem simple, stout; the racemose branches somewhat corymbose, nearly naked, hairy above, bearing 1–3 large heads; leaves glabrous, with scabrous margins, slightly serrate or nearly entire; the radical ones oval-lanceolate, tapering into a long narrowly-winged petiole, the lower cauline spatulate-lanceolate, acute, partly clasping; the upper narrowly oblong-lanceolate, often auriculate-clasping; scales of the involucre lanceolate, loose, equal, herbaceous; rays large.—*Lindl.! in Hook. fl. Bor.-Am.* 2. *p.* 10, *& in DC. prodr.* 5. *p.* 236.

Rocky Mountains (lat. 54°–56° ?), *Drummond!*—A plant with large heads, mostly solitary on the erect and simple often leafless branches; and ample scattered leaves; the radical ones, including the elongated petioles, sometimes nearly a foot in length. Achenia slightly pubescent. Dr. Lindley compares it with A. brumalis.

59. *A. Douglasii* (Lindl.): stem glabrous, racemose-compound; the (few-leaved) branches loosely paniculate-corymbose, bearing few (rather large) heads; leaves linear-lanceolate, acute, mostly somewhat narrowed at the base, glabrous, nearly all serrate; scales of the hemispherical involucre broadly linear (or the exterior spatulate-linear), acute, loosely imbricated somewhat in 3 series, rather unequal, with spreading herbaceous summits; rays rather large.—*Lindl.! in Hook. fl. Bor.-Am.* 2. *p.* 11, & *in DC. prodr.* 5. *p.* 239; *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 293.

Oregon, in low soils; common along the large rivers near the coast, *Douglas! Dr. Scouler! Nuttall!* Aug.–Sept.—Varies; with shorter branches and more numerous smaller heads; and with more slender and naked branches, bearing fewer and larger heads (*Lindl.*); and specimens collected by Mr. Nuttall have shorter and broader leaves, with rather strongly ciliolate-scabrous margins. Dr. Lindley considers it allied to A. eminens, which it resembles in foliage; and Mr. Nuttall compares it with A. Novi-Belgii, which it nearly approaches in the involucre and flowers.—The pappus turns brownish.

60. *A. laxifolius* (Nees): stem scabrous, racemose-compound, narrow; the branches racemose at the summit or slightly compound; leaves narrowly lanceolate (or lanceolate-linear), mucronately serrulate, attenuate to each end, clasping, flaccid, scabrous above; scales of the involucre linear, squarrose; those of the terminal heads nearly equal. *Nees, Ast. p.* 69. A. longifolius, *Nees, synops. p.* 26, and of the Leyden Garden; not of *Lam.*

β.? borealis: stem strict, smooth and glabrous, or pubescent towards the summit; leaves narrowly linear-lanceolate, elongated, with very scabrous sparingly serrulate or often entire margins; the upper surface slightly scabrous; heads solitary or few and mostly somewhat corymbose on the strict (often very short) branches; involucre about the length of the disk; the scales in 2–3 series, somewhat equal, lax, the summits more or less spreading or squarrose when old.—A. laxifolius (*a.* & *β.*), *Lindl.! in Hook. fl. Bor.-Am.* 2. *p.* 10, & *in DC. prodr.* 5. *p.* 236, (excl. *γ.* carneus.) A. salicifolius, *Richards.! appx. Frankl. journ. ed.* 1. *p.* 748, not of *Ait.?*—Varies; with the leaves serrulate and entire; the stem with single or few heads, corymbose or racemose-compound; the pappus turns brownish. *Lindl. in DC.*—Varies also (if we mistake not,) with the upper leaves rather shorter; the heads somewhat crowded on the branches; the scales of the involucre (except in the primary heads) more unequal and appressed; verging towards A. carneus. (A. strictus *β.* angustifolius, *Lindl.! in Hook. l. c.* Saskatchawan, *Drummond!* not Arctic America.) A state with rigid leaves, the upper ones longer than the simply racemose heads, is A. æstivus, *Lindl.! in herb. Torr.*

γ.? lætiflorus: stem slender, mostly scabrous, racemosely branched; the long and almost filiform branches spreading; leaves linear or narrowly lanceolate-linear, elongated, acute, rather rigid, scabrous above; the margins remotely serrulate or often entire, very scabrous; heads loosely racemose or somewhat paniculate at the extremity of the branches, on slender peduncles or nearly naked branchlets; scales of the involucre unequal, with somewhat spreading tips.

North America (cultivated in the Leyden Garden), *Nees.* *β.* Canada (*Mrs. Percival!*), Lake Huron (*Dr. Pitcher!*), and Saskatchawan! to Arctic America! and west to the Rocky Mountains! and the interior of Oregon!

γ. Milwaukie, Wisconsin, *Dr. Lapham!* Columbus, Ohio, *Mr. Sullivant!* Sept.–Oct.—We refer the A. salicifolius of Richardson to A. laxifolius, on the authority of Dr. Lindley, who is probably acquainted with the plant of Nees, whose specific phrase we have copied. But we must remark, that our specimens do not well accord with the description of that species, which is said to differ from A. vimineus, *Nees*, "by its minutely and remotely serrulate leaves, 5–7 inches long and 4–5 lines broad; by its narrower (flesh-colored) rays about half the size; and its earlier florescence"; and the stem is said to be "hinc inde setulis inspersus." A specimen from Philadelphia, mentioned by Hooker, accords with the character in the latter respect; but we are confident this is a fragment of A. puniceus γ. vimineus. Our var. β.? (which abounds in, and is nearly confined to the northern regions, and may therefore bear the name of A. borealis if it should prove to be distinct,) is a slender plant, from 1 to 3 feet high; the long and narrow leaves of nearly the same breadth throughout, and except the lowermost, not at all attenuate towards the base, but with a broad partly clasping insertion. The heads are nearly as large as in A. puniceus; the rays numerous and long (the ligule fully the length of the involucre), apparently violet-blue; the achenia in some specimens rather densely, in others sparingly appressed-pubescent.—The var. γ., which is probably not specifically distinct from the preceding, is a very graceful plant, apparently of considerable size, with long and slender lax branches, and the heads loosely disposed at their extremities. The cauline leaves are 4 or 5 inches long, and about 4 lines wide; those of the branches perhaps broadest at the partly clasping base. Heads fully as large as in the preceding form; the scales of the involucre narrowly linear, in about 3 unequal series, loose, but not inclined to become squarrose. Rays numerous, long, showy, apparently pale violet or purple; the disk turning purplish. Achenia minutely puberulent.—The A. thyrsiflorus of the European gardens may have been derived from this species.

† † Scales of the involucre loose, narrow, acute, often recurved or spreading.

61. *A. longifolius* (Lam.): glabrous; stem smooth or sometimes scabrous below, paniculately branched; the (middle-sized) heads loosely corymbose-paniculate; leaves narrowly lanceolate or linear-lanceolate, elongated, somewhat clasping, attenuate-acuminate, the lower mostly serrate in the middle with scattered and spreading sharp teeth, smooth beneath; the upper surface broadly scabrous towards the margins; scales of the broadly turbinate involucre narrowly linear, acute, nearly equal, with the summits spreading or often recurved; rays numerous.—*Lam. dict.* 1. *p.* 306, fide *DC.! prodr.* 5. *p.* 239. A. eminens, *Willd. enum.* 2. *p.* 886; *Nees, Ast. p.* 87. A. junceus, *Ait. Kew.* (*ed.* 1) 3. *p.* 204, fide *Nees, DC. &c.* A. lævigatus, *Pursh, fl.* 2. *p.* 553? (ex *Nees. & DC.*)

β. stem stout, scabrous below (roughened with minute sharp points); leaves mostly entire; the lower elongated-lanceolate; those of the branches oblong-lanceolate, short; scales of the involucre more or less unequal, with shorter and less spreading summits.

'Swampy places from New York to Carolina,' *Nees, DC.* (derived partly from the habitats cited by Pursh under A. junceus, lævigatus, &c.) Southern States, *Le Conte!* β. In the Southern States? *Le Conte!* Sept.–Oct.—We have never met with the native plant, except in the herbarium of Major Le Conte, whose specimens very well agree with cultivated forms. The latter are subject to considerable variation, and six varieties are characterized by Nees and De Candolle. To one of these, (A. eminens ε. lævigatus, *Nees, l. c.*, or A. longifolius ε. lævigatus, *DC. l. c.*) Nees adduces the synonym, A. mutabilis, *Ait.* and A. lævigatus, *Pursh:* this is said to be a tall plant (5–6 feet high); with the oblong-lanceolate leaves smooth, the margins only scabrous, rigid, bright green and lucid: perhaps our var. β. does not mate-

rially differ from it. Another, the A. longifolius η. albiflorus, *DC.* (A. eminens η. *Nees, l. c.* A. virgineus, *Nees, synops.*), has white rays, rarely verging to reddish-violet, and more scabrous as well as broader leaves: from this the A. eminens var. virgineus, *Lindl. bot. reg. t.* 1656, is said to differ in the coarsely serrate upper leaves, and the erect scales of the involucre.—The plant varies from 2 to 5 feet high: the leaves, of a rather firm texture, are pale and very smooth below, usually shining above and reticulated; the lower often 5 or 6 inches long, 3–7 lines wide, tapering to a long sharp point, and also usually narrowed towards the base; either entire, or sparingly serrate with sharp spreading teeth. The heads are barely middle-sized, but showy: the rays light blue. The scales of the involucre in our plant, as in several of the cultivated forms before us, are narrowly linear, loose, in about 3 series, nearly equal; the long and slender green tips recurved-spreading. Those of var. β. are more unequal, broader, more obtuse, loose, but less spreading. Achenia minutely pubescent.—A. squarrulosus, *Nees*, has apparently been derived from this species.

62. *A. Elliottii*: stem stout, very smooth and glabrous, the upper portion and the paniculate branches minutely and softly pubescent in decurrent lines; leaves somewhat coriaceous, smooth beneath, more or less scabrous above, serrate with appressed mucronulate teeth; the cauline ones oblong-lanceolate or spatulate-lanceolate, somewhat acuminate, tapering into an attenuate base (like a margined petiole), partly clasping but not dilated at the insertion; those of the branches short, spatulate, oblong, or oval-lanceolate, serrulate; heads (middle-sized) corymbose-paniculate; scales of the obovate involucre linear-subulate, somewhat equal, numerous, in about 3 series, nearly the length of the disk, their summits usually spreading or recurved; rays numerous, slender.—A. puniceus, *Ell.! sk.* 2. *p.* 255, (excl. spec. char.)

Margin of rivers, in the low country of Georgia and South Carolina, *Elliott! Miss Clay!* North Carolina, *Mr. Croom! Mr. Curtis!* Oct.-Nov.—A stout plant, 2–3 feet high, with a somewhat angled stem, and numerous often crowded and rather simple flowering branches; the heads either racemed, or more commonly paniculate or corymbose at the summit. Cauline leaves 4–6 inches long, an inch or less in width, of a rigid texture, pale when dry, and not lucid, with a very strong midrib; those of the branches small, much less tapering at the base, abruptly acuminate or mucronate-acuminate, nearly all serrulate with sharp closely appressed teeth. Scales of the involucre very narrow (narrower than in any state of A. puniceus) and acute, somewhat ciliate, all similar. Rays long and narrow, "bright purple" (*Ell.*), in dried specimens appearing reddish-purple or pink; the disk-flowers apparently not changing to purple. Achenia very slightly pubescent under a lens. Pappus tawny when old.—We cannot ascertain that this species has been noticed by any author except Elliott, who has in fact described it as a distinct species, under A. puniceus. It should be placed between the latter and A. Novi-Belgii, which it more nearly resembles in the foliage, while the involucre, rays, &c. are very different. We have never observed the young leaves pubescent, as described by Elliott.

63. *A. puniceus* (Linn.): stem hispid, stout, paniculate above; leaves oblong-lanceolate, clasping by a more or less auriculate base, acuminate, serrate in the middle with mucronate-acute mostly appressed teeth, scabrous above, usually smooth and glabrous beneath (except the sometimes scabrous-hispid midrib); heads (pretty large) racemose or paniculate towards the summit of the leafy branches; scales of the involucre narrowly linear or subulate-linear, acute, loose, equal, in about 2 series, as long as the disk, more or less spreading; a few of the exterior (especially in the terminal heads) often broader, more foliaceous (linear-lanceolate) and bracteolate;

rays numerous, showy.—*Linn.! hort. Cliff. p.* 408, & *spec.* 2. *p.* 875; *Ait. Kew.* (*ed.* 1) 3. *p.* 208; *Michx.! fl.* 2. *p.* 115; *Willd. spec.* 3. *p.* 2040; *Pursh! fl.* 2. *p.* 554; *Hook.! fl. Bor.-Am.* 2. *p.* 10; *Darlingt.! fl. Cest. p.* 465; *DC.! prodr.* 5. *p.* 236. A. Americanus latifolius, puniceis caulibus, *Herm. Lugd. p.* 649, *t.* 651. A. hispidus & A. amœnus, *Lam. dict.* 1. *p.* 306, fide *Michx. & Nees.* A. altissimus, *Mill. dict.*—Varies; with the stem (which is commonly purple, and densely hispid with rough and short spreading pointed hairs,) sometimes rather hirsute with longer and softer hairs, and sometimes more sparsely hispid or in lines, or below only hispid-scabrous: in size, 3–6 feet high; or rarely 1–2 feet high (A. puniceus, *var.* demissus, *Lindl. bot. reg. t.* 1636): in the size of the heads equalling A. Novæ-Angliæ, especially when scattered; or considerably smaller; frequently very numerous and corymbose-paniculate: the leaves varying from rather narrowly lanceolate to oblong-lanceolate or oblong, or the lower even obovate-oblong; either narrowed near the base, or cordate-clasping; the teeth scattered or more numerous, small, sometimes obscure, occasionally conspicuous; their texture, when growing in shade, thin and then moderately scabrous above; in exposed situations thicker, very scabrous above, and even somewhat so beneath.

β. firmus: stem lower, stout, often angled, smooth and glabrous below, towards the summit slightly hairy or hispid, either sparsely or in lines; leaves moderately or slightly scabrous above; exterior scales of the involucre rather broader and more foliaceous; "rays bluish-lilac."—A. firmus, *Nees, Ast. p.* 66 (v. sp. *in hort. Berol.*); *DC. prodr.* 5. *p.* 235, excl. syn. *Ell.!* A. vimineus, *Lindl.! in Hook. fl. Bor.-Am. l. c.* in part. (Lake Huron, *Dr. Todd!* Stem a little more hairy.)

γ. vimineus: stem smooth and glabrous below; somewhat pubescent or hispid in lines near the summit and along the branches; leaves lanceolate, attenuate-acuminate, usually minutely and sparingly serrate towards the middle, clasping by the auriculate base, more or less scabrous above, very glabrous beneath; exterior scales of the involucre rather broader and more foliaceous.—A. vimineus, *Willd. spec.* 3. *p.* 2046, fide *Nees*, (not of *Lam.*); *Spreng. syst.* 3. *p.* 538 (excl. syn.); *Nees, Ast. p.* 68; *DC. l. c.; Lindl.! in herb. Torr.*—Varies; with the stem (pale or purple, often angled, usually branching in a pyramidal or thyrsoid manner) either almost entirely glabrous, or more or less hispid in lines, or even with scattered bristly hairs; the branches all short, ascending (A. vimineus *β. Nees*; leaves smooth above); or the lower ones elongated; the leaves (mostly 4–6 inches long and 5–10 lines wide) sometimes nearly smooth above, &c.

Low grounds and swampy thickets, Canada! (from Hudson's Bay) and rather common throughout the Northern States! Sept.-Oct.—A well-marked species, varying somewhat in appearance when it grows in wet shady places. We are perfectly satisfied that A. firmus and A. vimineus of Nees are only varieties or states of this species: the latter is a form which the plant assumes in deep shade; and we have seen specimens with the stem quite as hispid as in ordinary states of A. puniceus, and even with the midrib beneath pubescent with the same kind of hairs. We also consider the A. luxurians *β. Lindl.! in Hook. fl. Bor.-Am. l. c.* (Canada, *Mrs. Percival!*) to be a state of this species.—The leaves are ordinarily pretty large and uniform. The rays are numerous, rather large, violet-purple, varying in shade to pale lilac-blue; the disk turning purplish or brownish; the achenia minutely and sparsely pubescent.

64. *A. prenanthoides* (Muhl.): stem pubescent or hirsute above mostly in decurrent lines, paniculate-corymbose at the summit; leaves spatulate-lanceolate or lanceolate-oval, incisely serrate in the middle with sharp spreading teeth, conspicuously acuminate, tapering into a long narrow base like a winged petiole, with a cordate-clasping insertion; the lower surface smooth,

the upper scabrous; heads on short and rather rigid spreading peduncles; scales of the obovoid involucre narrowly linear, acute or acuminate, unequal, imbricated in 3 or 4 series, with recurved-spreading herbaceous summits.—*Muhl.! in Willd. spec.* 3. *p.* 2046; *Pers. syn.* 2. *p.* 446; *Nees, Ast. p.* 61; *Darlingt.! fl. Cest. p.* 465; *DC. prodr.* 5. *p.* 234.

β. scaber: stem sparsely roughish-hirsute, or even hispid above; leaves less conspicuously attenuate towards the base, the upper surface very scabrous.

Moist woods and thickets, Western New York! Pennsylvania! Ohio! Kentucky! and probably throughout the Alleghany Mountains. *β.* West-Chester, Pennsylvania, *Darlington, Mr. Townsend!* (in *herb. Hook.*) Sept.–Nov.—Stem 1–4 feet high, angled, rather stout, usually pubescent only in decurrent lines, or entirely glabrous below, bearing few or numerous pretty large heads, in a terminal loose and expanding, simple or compound, or somewhat paniculate corymb. Leaves of a membranaceous rather firm texture, veiny, lively green above, pale beneath, and frequently a little hairy along the midrib; the lower cauline 5–6, or even 8–10, inches long, the attenuate lower portion 2–3 inches long, entire, not ciliate, more or less dilated and auriculate-cordate at the insertion; the uppermost, and those of the branches smaller, and less narrowed below, less serrate, but otherwise similar; those of the branchlets often linear and entire. Involucre glabrous, or minutely pubescent under a lens. Rays rather large, pale violet, or in deep shade nearly white; the disk turning purplish. Achenia narrow, slightly cuneiform, a little narrowed at the summit, contracted at the base as if somewhat stipitate, scabrous-pubescent. Pappus unequal.—A very marked species, imperfectly characterized by Willdenow, but accurately described by Nees from dried specimens. It has never found its way into the gardens, and appears to be known to few botanists; yet, it is not uncommon within the geographical range we have given. Distinct as the species certainly is, the var. *β.* (as Dr. Darlington has noticed) makes a near approach to A. puniceus, and appears like a hybrid between the two.

65. *A. mutatus:* stem hairy, racemose-corymbose; the branches simple, fastigiate, glandular-pubescent at the summit, terminated by single heads; leaves (membranaceous) lanceolate, very acute, slightly and remotely serrate, pubescent both sides, partly clasping, the upper clasping by a broad base; scales of the hemispherical involucre narrowly linear-lanceolate, very acute, foliaceous, loose, nearly in a single series, as long as the disk; rays numerous.—A. Unalaschkensis *β.*? major, *Hook.! fl. Bor.-Am.* 2. *p.* 7.

Saskatchawan to the Rocky Mountains, *Drummond!*—Stem about 2 feet high, pubescent with loose spreading hairs; the branches slender, erect. Leaves very thin, 3–4 inches long, tapering to a sharp point; those of the branches smaller but similar, broader at the base and more clasping. Heads about as large as in A. puniceus; the scales of the almost simple involucre somewhat pubescent, loose or spreading. Rays (blue or pale purple?) about 30, rather narrow, much longer than the disk. Appendages of the style lanceolate. Achenia (immature) compressed, ribbed, minutely pubescent with scattered appressed hairs.—This plant has the involucre of an Alpigenous Aster, but the receptacle is alveolate, &c.

* * * * * * * * * * * *Heads (large and showy) terminating the corymbose or paniculate branches: scales of the involucre numerous, in 2–several series, somewhat equal; the short rather rigid base appressed; the elongated foliaceous upper portion spreading or squarrose: achenia villous or canescent, rarely glabrous: pappus slightly rigid: rays numerous, purple or violet: leaves lanceolate or linear-oblong, mostly entire, sessile, often partly clasping: branchlets and involucre often glandular, viscid, or granular-puberulent.*—Grandiflori.

† Scales of the involucre imbricated, with squarrose-reflexed foliaceous summits.

66. *A. grandiflorus* (Linn.): hispid with sharp rough hairs; stem stout, racemosely branched or compound; leaves linear-spatulate, obtuse, mucronulate, closely sessile, reflexed or recurved, very rough, numerous; those of the branches small, oblong-linear or lanceolate; heads (very large) solitary, terminating the branches; scales of the involucre similar to the uppermost leaves, imbricated in several series, the summits squarrose-reflexed; achenia strigose-hirsute.—*Linn. spec.* 2. *p.* 877; (*Gronov.! fl. Virg. ed.* 1. *p.* 99; *Mill. ic. t.* 282;) *Hoffm. phytogr. bl. p.* 65, *t. A, f.* 1; *Michx.! fl.* 2. *p.* 111; *Pursh, fl.* 2. *p.* 550; *Ell. sk.* 2. *p.* 344; *Lindl. bot. reg. t.* 273; *Nees, Ast. p.* 50; *DC.! prodr.* 5. *p.* 232. A. grandiflorus asper, squamis reflexis, *Dill. Elth. t.* 36, *f.* 41. A. asperrimus, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 293.

Dry soil, in the mountains and upper country of Virginia! North Carolina! and Georgia! apparently not common; cultivated for more than a century in European gardens. Sept.–Nov.—Stem and branches rigid. Leaves very small in proportion to the heads; the lower 1–2 inches, those of the branches often less than half an inch in length, thickish, somewhat papillose, and hispid with very sharp rigid hairs. Heads of the cultivated plant perhaps the largest of the genus; in indigenous specimens frequently not larger than in A. spectabilis, slightly viscid. Scales of the involucre much more numerous in the cultivated than in the indigenous plant, and with longer and narrower squarrose foliaceous appendages, slightly viscid; the chartaceous base appressed. Rays large, violet.—In habit, the wild plant approaches the section Calliastrum.

67. *A. Carolinianus* (Walt.): minutely or canescently pubescent; stem suffrutescent, much branched, diffuse or decumbent, flexuous; the heads somewhat racemose or scattered; leaves oblong-lanceolate, entire (or serrate on the sterile branches), attenuate to each end, very sharply acuminate, the narrowed base abruptly dilated and auriculate-clasping at the insertion; scales of the involucre linear, canescent, imbricated in several series, unequal, with short foliaceous squarrose-reflexed tips; achenia narrow, ribbed, glabrous.—*Walt. Car. p.* 208; *Michx.! fl.* 2. *p.* 111; *Pursh, fl.* 2. *p.* 550; *Nutt.! gen.* 2. *p.* 156; *Ell.! sk.* 2. *p.* 353; *Nees, Ast. p.* 48; *DC.! prodr.* 5. *p.* 232. A. scandens, *Jacq. f., in Spreng. syst.* 3. *p.* 524.

In swamps and moist thickets, South Carolina! to Georgia! and Florida! Sept.–Oct.—Stem often trailing or supported by other plants, and attaining the height of 8 to 12 feet, very pubescent when young, not viscid nor glandular; the showy heads (as large as in A. patens) mostly solitary on short branchlets or peduncles, scattered. Leaves 1 to 3 inches long, clothed with a minute and close soft pubescence, or nearly canescent when young, or the upper surface slightly scabrous when old, produced to a very sharp acuminate point; the lowermost narrowed towards the base, as if petioled, but dilated at the insertion. Scales of the involucre rather rigid, not glandular or viscid, appressed except the squarrose tips; the exterior shorter and with the short tips slightly dilated; the interior narrowly linear, as long as the disk. Rays bright purple (*Ell.*), or often purplish rose-color, numerous; the disk turning purplish. Achenia linear, 10-ribbed, slightly puberulent when young, but perfectly glabrous when mature. Pappus turning reddish-brown.—The leaves of the young sterile branches are sometimes coarsely toothed.

68. *A. oblongifolius* (Nutt.): stem much branched, diffuse or divaricate, somewhat hairy; the branchlets loose, paniculate-corymbose, and with the involucre and uppermost leaves more or less glandular or granular-scabrous; leaves narrowly oblong or lanceolate, mucronulate-acuminate, entire, partly clasping, somewhat scabrous; scales of the involucre numerous, broadly linear, somewhat unequal, appressed at the base, with elongated and squar-

rose foliaceous summits; achenia canescent.—*Nutt.! gen.* 2. *p.* 156, *& in trans. Amer. phil. soc. l. c.*; *Nees, Ast. p.* 48; *Hook.! compan. to bot. mag.* 1. *p.* 97; *DC.! prodr.* 5. *p.* 232. A. graveolens, *Nutt.! in jour. acad. Philad.* 2. *p.* 110, *& in trans. Amer. phil. soc. l. c.*

Rocks along rivers, and on dry prairies, from the upper Mississippi! and Missouri! to Arkansas! Kentucky! and Illinois! Sept.–Oct.—Stems numerous from the same root, often suffruticose at the base, rigid, erect or ascending, much branched, 1–2 feet high, somewhat hirsute or nearly glabrous below: the branches, young leaves, and involucre covered, more or less abundantly, with minute resinous and somewhat viscid granules, on which account the plant exhales a heavy odor. Leaves 1 to 2 inches long, varying from 2 to 5 lines in breadth, often nearly linear, abruptly acute or mucronate, pale, rather rigid, reticulated, more or less scabrous with minute strigose hairs, particularly on the margins which are sometimes scabrous-ciliate; the upper ones more manifestly sprinkled with resinous dots, which are frequently pedicellate, so as to appear like glandular hairs; those of the branchlets small, often crowded, gradually passing into the scales of the involucre. Heads very numerous, scarcely as large as in A. Carolinianus; the scales of the involucre with more or less prolonged foliaceous summits, which are squarrose-spreading or at length reflexed; all equal in length, or the exterior somewhat shorter. Rays purple or violet. Achenia canescent with a fine closely appressed pubescence. Pappus brownish.—The numerous specimens before us afford no characters to distinguish the A. graveolens from the A. oblongifolius of Nuttall.

69. *A. amethystinus* (Nutt.): hirsute with a close somewhat cinereous pubescence; stem racemose-paniculate; leaves nnmerous, linear-lanceolate, entire; strigose-scabrous, acute, partly clasping by a dilated or auriculate base; scales of the involucre somewhat equal, not glandular or viscid, linear, acute, erect, with squarrose foliaceous tips; achenia silky.—*Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 294.

Near Boston and Salem, Massachusetts, *Nuttall! Mr. Little!* Sept.?—We have only seen branches; with leaves about an inch long, abont 2 lines wide, thickish, minutely reticulated, pale, strigose under a lens: the numerous racemose branchlets are furnished with similar leaves of a smaller size, and bear one to three or four heads, scarcely half the size of those of A. Novæ-Angliæ. Involucre about the length of the disk; the scales minutely strigose; the exterior slightly spatulate, the lower whitish portion somewhat narrowed; the innermost rather longer and more attenuated. Rays numerous, azure according to Nuttall, appearing violet in dried specimens. Pappus turning brownish.—Resembles A. oblongifolius.

† † Scales of the involucre loose, very narrow (glandular-viscid), appearing as if nearly in a single series.

70. *A. Novæ-Angliæ* (Linn.): stem stout, hispid, corymbose at the summit; the branchlets and involucre somewhat viscid; leaves very numerous, lanceolate or lanceolate-linear, auriculate-clasping, entire, acute, clothed with a close somewhat scabrous pubescence; scales of the involucre narrowly subulate-linear, lax, equal, as long as the disk; achenia villous-hirsute.—*Linn. hort. Cliff. p.* 408, *& spec.* 2. *p.* 875; *Ait. Kew.* (*ed.* 1) 3. *p.* 201; *Michx.! fl.* 2. *p.* 113; *Pursh, fl.* 2. *p.* 549; *Nutt.! gen. p.* 156; *Ell.! sk.* 2. *p.* 351; *Lindl. bot. reg. t.* 183; *Bigel. fl. Bost. ed.* 2. *p.* 310; *Nees, Ast. p.* 46; *Hook.! fl. Bor.-Am.* 2. *p.* 8; *Darlingt.! fl. Cest. p.* 462; *DC.! prodr.* 5. *p.* 233. A. Novæ-Angliæ altissimus, &c., *Herm. parad. Batav. t.* 98. Asteropholis, *Pont. diss. p.* 242. A. amplexicaulis, *Lam. dict.* 1. *p.* 304; not of *Willd.*, nor of *Michx.* A. spurius, *Willd. spec.* 3. *p.* 2032; *Nees, synops. p.* 20.

Low or moist grounds, Canada and Northern States! to Missouri! Kentucky! and the upper districts of the Southern States! Sept.–Oct.—Stem 3–8 feet high, mostly purple, hirsute with spreading sharp jointed hairs; the summit and branches furnished besides with a more or less copious close granular-viscid pubescence, which also clothes the pedicels and the involucre, and exhales a faint resinous odor. Leaves 2–4 inches long, about half an inch wide, finely reticulate-veined, often somewhat 3-nerved; the lower more obtuse; those of the flowering branches often tinged with purple, like the involucre. Heads in a short thyrsus or corymb, or in compound somewhat paniculate corymbs, often an inch and a half in diameter, including the large and very numerous violet-purple rays; the latter sometimes rose-color in cultivation (A. roseus, *Desf. cat. hort. Par.*); the disk turning slightly purplish. Scales of the involucre numerous in 2–3 series, but similar in size and form, lax, and very narrow, so that the involucre appears nearly as simple as an Alpigenous Aster, attenuate from the short chartaceous appressed base to the apex; or the outermost almost entirely foliaceous.—A handsome and well-known species, of very uniform appearance in its native situations, but several varieties have resulted from long cultivation in the European gardens. To this, or to A. puniceus, probably belongs the A. concinnus, *Colla, hort. Ripul. appx.* 3, *in act. acad. Tur.* 33. *p.* 134, *t.* 12, which De Candolle has incautiously cited under A. concinnus, *Willd.*

71. *A. modestus* (Lindl.): stem glabrous below, the summit and the peduncles, or branches of the simple corymb, glandular-pubescent; leaves numerous, lanceolate, acuminate, sparingly and sharply serrate, glabrous, partly clasping; scales of the involucre linear-lanceolate, acute, lax, equal, about the length of the disk; achenia pubescent.—*Lindl.! in Hook. fl. Bor.-Am.* 2. *p.* 8, *& in DC. prodr.* 5. *p.* 231.

β. branches of the corymb longer and somewhat leafy; scales of the involucre rather shorter.—A. Sayianus, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 294.

Mountain woods at the mouth of Smoking River, lat. 56° (near the Rocky Mountains), *Drummond!* *β.* Forests of the Rocky Mountains (lat. 42°?), and plains of the Oregon, *Nuttall!*—Stem about a foot high, simple. Leaves about 3 inches long, less than an inch wide, serrate with small often spreading teeth; the uppermost clasping by a broad base; the lower somewhat narrowed at the base and less clasping. Heads few, resembling those of A. Novæ-Angliæ; the scales of the involucre fewer and rather broader, somewhat glandular. "Rays pale blue," *Nutt.* Achenia 10-ribbed, pubescent, especially on the ribs, both in *α.* and *β.*, which differ very slightly.

*** Several insufficient specimens of undetermined species remain in our collections, or in those submitted to our examination: we think it better to leave them unnoticed than to describe from imperfect materials, which is very hazardous in such a genus as the present.

‡ *Species unknown to us, founded on native specimens.*

72. *A. cærulescens* (DC.): stem erect, smooth; branches erect, leafy, racemose; leaves sessile, about half-clasping, broadly linear or lingulate, acute somewhat coriaceous, entire, almost smooth, the margins and midrib beneath scabrous; those of the branchlets (which bear single heads) gradually passing into the oblong acute loosely imbricated and slightly squarrose scales of the involucre. *DC. prodr.* 5. *p.* 235.

Texas, in the eastern districts, *Berlandier.*—Cauline leaves 3 to 4 inches long, 4 lines broad. Heads as large as in A. puniceus; the rays pale-blue. Achenia almost glabrous. Pappus reddish-brown, *DC.*—The species is placed next to A. puniceus.

73. *A. multiceps* (Lindl.): glandular-pubescent throughout; stem racemose; the branches erect, bearing single heads; leaves oblong-linear, acute, pubescent, slightly scabrous; scales of the involucre linear, subulate, whitish at the base, squarrose. *Lindl. in DC. prodr.* 5. *p.* 237.

Louisiana.—A very distinct species, not closely allied to any one known; perhaps of the Amelli section, if the inner scales of the involucre were membranaceous and colored. *Lindl.*—We know not from whom this species was derived. It is placed at the end of the section which includes A. puniceus, prælatus, &c.

74. *A. subspicatus* (Nees): stem hairy in lines; the branches virgate; the branchlets hirsute, bearing the heads somewhat in spikes; leaves oblong-lanceolate, acute, appressed-serrate, glabrous, with scabrous margins, clasping; scales of the involucre somewhat equal, lax; the exterior spatulate-lanceolate, broader. *Nees, Ast. p.* 75; *DC. prodr.* 5. *p.* 237.

Mulgrave Promontory, on the North West Coast of America. (*Nees.*)—Heads of the size and form of those of A. obliquus, 3–7 upon each branchlet, nearly sessile (on hirsute pedicels scarcely half a line long) in the axils of the upper leaves, approximate, solitary, or 2 to 3 on the highest branchlets. Involucre as long as the disk, erect, loose; the scales in several series; the inner linear-lanceolate, mucronate-acute, ciliate; the base membranaceo-chartaceous, pale, with a green nerve which is lanceolate-dilated upwards. Rays numerous, lanceolate, purplish; the disk-flowers turning rose-color: 'stigmas short, dimidiate-conic, scabrous.' Achenia small, obconic, densely canescent-strigulose. Pappus brownish. *Nees.*—It is placed in the same section with A. Novi-Belgii, &c.

75. *A. blandus* (Pursh): stem pyramidate-branched; the branches axillary, scarcely longer than the leaves, bearing the heads in racemes; peduncles tomentose, naked; leaves oblong-lanceolate, partly clasping, acuminate, serrate, glabrous; scales of the involucre lax, somewhat equal, shorter than the disk. *Pursh, fl.* 2. *p.* 555; *DC prodr.* 5. *p.* 237.

Canada, *Herb. Banks.* 2{ Oct.–Nov. Flowers above the middle size: rays pale purple. *Pursh.*—Nothing farther is known respecting this species. The A. blandus, *Lodd. bot. cab. t.* 959 (perhaps A. puniceus?) is doubtless different from Pursh's plant.

76. *A. hebecladus* (DC.): stem slightly shrubby, slender, hirsute with a close spreading pubescence; branches loose, leafy, with few branchlets bearing single heads; leaves sessile, linear, entire, mucronate-acute, both sides villose-scabrous; the uppermost ciliate; scales of the involucre loosely imbricated, linear, puberulent, acute. *DC. prodr.* 5. *p.* 242.

Texas, in the eastern districts, *Berlandier.*—Allied to A. scoparius, but with looser hirsute branches, bearing few heads about one-third the size. *DC.*

77. *A. scoparius* (DC.): stem slightly shrubby, erect, much branched, glabrous, scarcely puberulent at the summit; branches erect, racemose; leaves sessile, linear, minutely scabrous, the upper ones ciliate; branchlets leafy; scales of the involucre loosely imbricated, linear, acute, ciliate. *DC. prodr.* 5. *p.* 242.

Texas, in the eastern districts, *Berlandier.*—Plant with nearly the habit of Erica scoparia. Leaves 4–5 lines long, half a line wide. Pappus reddish-brown. Achenia puberulent. *DC.*—This and the preceding are placed in the same section with A. ericoides, A. dumosus, &c.

78. *A. bifrons* (Lindl.): stem scabrous, lax, racemose; branches racemose at the summit; leaves oval-lanceolate, scabrous above, nearly all serrate; heads secund; scales of the involucre subulate. "*Nees in litt. ad Lindl.*"; *DC. prodr.* 5. *p.* 243.

North America.—Allied to A. pendulus; distinguished by the branches

bearing fewer and larger heads. *Lindl.*—Apparently described from indigenous specimens; most probably one of the larger forms of A. miser.

79. *A. reticulatus* (Pursh): canescently tomentose throughout; stem branching above, the branches corymbose-racemose at the summit; peduncles nearly leafless; leaves lanceolate-oblong, sessile, acute at each end, with revolute margins, beneath reticulate-veined, tripli-nerved; involucre rather loosely imbricated; the scales very acute. *Pursh, fl.* 2. *p.* 548.

In dry swamps of Carolina and Georgia. 2f Aug.–Oct.—About 3 feet high: flowers middle-sized: rays and florets white. *Pursh.*—This plant has not been identified by any succeeding botanist; and notwithstanding the accustomed *v. v.* of Pursh, we believe that he never travelled in Carolina and Georgia. It probably belongs to some other genus.

80. *A. ciliatus* (Walt.): leaves lanceolate, entire, ciliate; stem 3 feet high; heads large (purple), somewhat solitary; peduncles leafy. *Walt. Car. p.* 209.

South Carolina, *Walter.*—The subsequent A. ciliatus of Willdenow is only a form of A. multiflorus; but this is apparently altogether a different species.

A. leucanthemus of Rafinesque ("Leaves semi-cuneiform, incised-serrated; flowers terminal; crown semi–10-flosculous." *Raf. in med. repos.* (*hex.* 2) 5. *p.* 359. Virginia.) is doubtless not the A. leucanthemos, *Desf. Nees, &c.*

‡ ‡ *Species described from garden specimens* (*some of them of doubtful origin*), *which we have not identified with native plants.*

81. *A. auritus* (Lindl.): stem racemose-compound; the branches rigid, densely racemose at the summit; leaves oblong, acuminate, cordate and clasping at the base, smooth above, pubescent beneath; scales of the slightly imbricated involucre linear, acuminate, glandular, as also the branchlets. *Lindl.! in DC. prodr.* 5. *p.* 232.

"North America? Cultivated, but rarely, in the English gardens. Near A. patentissimus." *DC.*—Apparently a cultivated state of A. patens *var.* phlogifolius.

82. *A. præcox* (Willd.): stem racemose; the branches bearing few heads, naked at the base; leaves ovate-lanceolate, serrate with spreading teeth, acuminate, tapering into an adnate [winged] petiole, glabrous, the margins scabrous, ciliate towards the base; the radical ones ovate and petioled; scales of the involucre lanceolate, acute, loose, nearly equal, erect; achenia pubescent. *Nees.* (char. & descr.)—"*Willd. enum. hort. Ber. suppl. p.* 58"; *Link, enum.* 2. *p.* 328; *Nees, Ast. p.* 63; *DC. prodr.* 5. *p.* 235.

North America (?): described from a plant cultivated in the Berlin garden. July–Aug.—We have gathered specimens of this apparently well-marked species in the Berlin botanic garden; but we suspect it is not of American origin. The A. præcox of Lindley (in *Hook. fl. Bor.-Am.*) bears considerable resemblance to it, but belongs, in our opinion, to a different species.—The A. præcox and the two following species belong to the section Petiolati of Nees: 'Leaves rather broad, serrate; the radical and lower cauline tapering into a petiole; the upper cauline also narrowed at the base, but sessile.' The cauline leaves of this species are 3 to 4 inches long, an inch or less in width, acuminate or attenuate at each end, serrate with unequal and remarkably spreading subulate-pointed teeth, and ciliate with very short and scattered rough hairs along the contracted base. The heads are about as large as in A. acuminatus; the scales of the involucre barely in a double

series, rather firm, shorter than the pappus. The rays are pale lilac. The stem is glabrous or slightly pubescent, 1 to 2 feet high.

83. *A. abbreviatus* (Nees): stem erect, glabrous, or hairy in lines, racemose; the branches short, thyrsoid or simple; lower leaves oval-lanceolate, serrate, adnate-decurrent along the petiole, scabrous above, smooth beneath; the upper oblong-lanceolate and somewhat entire; scales of the involucre loosely imbricated, lanceolate-linear. *DC.—Nees, synops. p.* 16; *DC. prodr.* 5. *p.* 234. A. Cornuti, *Mull.* ex *Nees.* A. acuminatus, *Nees, Ast. p.* 60, not of *Michx. &c.* (Varies with the branches short or elongated. Rays pale blue. *DC.*)

North America? (obtained by Nees, in the year 1802, from the Marburg garden.) Sept. (v. sp. in. *hort. Berol.*)—Nees has strangely confounded this species with the widely different A. acuminatus, *Michx.* It resembles A. præcox, and is also compared with the following species. The lower leaves are scabrous and tapering to the base, while the uppermost are smooth and closely sessile by a broad base. Perhaps it is not of American origin.

84. *A. patulus* (Lam.): stem glabrous, racemose-paniculate; the branches spreading; leaves oblong, deeply serrate, tapering into a petiole; the upper surface glabrous, or rough with a very minute pubescence; the lower glabrous; the margins scabrous; involucre imbricated [achenia glabrous]. *DC.—Lam. dict.* 1. *p.* 308; *Desf.! cat. hort. Par. p.* 102; *DC.! prodr.* 5. *p.* 234. A. paniculatus, *Willd. spec.* 3. *p.* 2035 (in part), fide *Nees.* A. Tradescanti, *Hoffm. phytogr. bl. p.* 68, *t. D. f.* 2, fide *Nees.* A. Cornuti, *Wendl. in Nees, Ast. p.* 58.

β. rays pale; leaves somewhat glabrous. *DC. l. c.* "A. pallens, *Willd. enum. suppl. p.* 58; *Lindl. bot. reg. t.* 1509," ex *DC.* A. Cornuti β. *Nees, l. c.* (v. sp. ex *hort. Par. & hort. Berol.*)

North America.—This is doubtless of American origin, and was perhaps derived from Canada; but we have never met with an indigenous specimen: the A. Cornuti, *Hook. fl. Bor.-Am.* appears to be only a state of A. miser; and is certainly different from the plant cultivated under that name in the Berlin garden.—The cultivated plant has much the habit of A. cordifolius, &c., except that none of the leaves are cordate. Stem 2 to 3 feet high, glabrous; the spreading paniculate branches somewhat pubescent in lines; the heads mostly solitary on the branchlets. Leaves all very sharply serrate, with more or less incurved teeth; the lowermost elliptical, tapering into a channelled petiole, acute, the base and apex entire; the upper oblong and oblong-lanceolate, much acuminate, narrowed below, sometimes into a short margined petiole; those of the branches sessile. Heads middle-sized. Scales of the involucre imbricated in 3 to 4 series, somewhat unequal, subulate linear, acute. Rays numerous, narrow, blue according to De Candolle, flesh-color turning purplish according to Nees. Achenia perfectly glabrous.

85. *A. stenophyllus* (Lindl.): stem nearly glabrous, racemose; the branches spreading, very densely racemose at the summit; cauline leaves linear-lanceolate, much acuminate, rather scabrous; heads secund; scales of the involucre linear, acuminate; the inner membranaceous and colored. *Lindl. in DC. prodr.* 5. *p.* 243.

North America? Cultivated in the English gardens.—Rays pale flesh-color; the disk changing. *Lindl.*—Placed between A. diffusus and A. miser.

86. *A. obliquus* (Nees): stem glabrous below, racemose-compound above, strict; the branches somewhat corymbose at the summit; leaves linear-lanceolate, sessile, mucronate, somewhat entire, scabrous above, oblique; those of the branches spreading; involucre lax; the exterior scales larger, spatulate-lanceolate, speading. *Nees, Ast. p.* 76; *DC. prodr.* 5. *p.* 237. A. rigidulus, *Desf. cat. hort. Par.* (1815) *p.* 122, fide *Nees & DC.*

North America. New York, *Bernhardi*, ex *Nees*.—Heads small, lilac and white. Exterior scales of the involucre few, 1–2, linear-spatulate, exceeding or equalling the others, which are linear, nearly equal, and with a membranaceous margin. Achenia pubescent-scabrous.—This, to us extremely obscure species, is placed by Nees between A. blandus and A. hiemalis, and is considered to be the A. lanceolatus of American authors. Nees has a wild specimen from New York, but we cannot identify the plant.

87. *A. æstivus* (Ait.): leaves lanceolate, somewhat clasping, entire, glabrous, with scabrous margins; scales of the lax involucre equal; stem (2 feet high) hispid; rays blue. *Ait. Kew.* (*ed.* 1.) 3. *p.* 203.

"Labrador Starwort. Native of North America. Introduced, 1776, by Messrs. Gordon & Græffer. July–Aug." *Ait. l. c.*—Willdenow gives the following character: "Leaves lanceolate, somewhat clasping, entire, attenuate at the apex, the margins scabrous; stem branched from the base, erect; branchlets hairy; scales of the involucre lax, linear, acute, equal;" and he remarks that it is nearly past flowering when the other American species commence. Pursh, who copies the character of Willdenow, professes to have seen the plant in dry swamps and copses in New York and Pennsylvania, as well as dried specimens in the Banksian herbarium and that of Mr. Lambert. Nees, who describes both from spontaneous and cultivated specimens (although the origin of the former is not mentioned), gives the following character: "Leaves lanceolate, ciliate; the radical appressed-serrate; the cauline entire; stem (glabrous) paniculately branched or racemose; the branchlets loose, scattered, one-flowered; inner scales of the narrow obconic involucre subulate." *Nees, Ast. p.* 74. It often begins to flower, according to Nees, in the middle of the month of June. The heads are said to be small; the rays nearly white; the achenia puberulent and narrowed into a stipe. We have not been able to identify either the original species of Aiton, or that of Nees (which are probably different) with indigenous specimens; nor do we possess specimens of the cultivated plant.

88. *A. foliolosus* (Ait.): stem pubescent; leaves lanceolate-linear, entire, glabrous; those of the branches much spreading; involucre imbricated, the scales acute. *Ait. Kew.* (*ed.* 1) 3. *p.* 202. A. ericoides Meliloti agrariæ umbone, *Dill. Elth. p.* 39, *t.* 35, *f.* 39. A. hiemalis, *Nees, Ast. p.* 77? (A. salicifolius, *Nees, synops. p.* 26.)

North America: Cult. 1732, by James Sherard, M. D. *Hort. Kew.*—The A. foliolosus of Aiton appears to have been founded upon the plant of Dillenius, which Nees cites under his A. hiemalis, a species of unknown origin. The description of A. hiemalis accords very well with the figure of Dillenius.

89. *A. thyrsiflorus* (Hoffm.): stem racemose-compound, spreading; the branches elongated, spicate-racemose at the summit; leaves linear-lanceolate, attenuate, clasping, the margin scabrous, serrulate; scales of the lax involucre lanceolate, unequal, recurved. *Nees.*—"*Hoffm. phytogr. bl.* 1. *p.* 83, *t. D, f.* 1"; *Nees, Ast. p.* 65; *DC. prodr.* 5. *p.* 235. A. junceus, *Ait. Kew.* (*ed.* 1) 3. *p.* 204? A. recurvatus, *Willd. spec.* 3. *p.* 2047 (chiefly), fide *Nees.*

β. squarrosus (Lindl.): leaves all linear, squarrose-recurved; branches racemose at the summit; heads larger. *Lindl.! in DC. l. c.*

Virginia? (*Hoffman.*) Oct.–Nov.—Cauline leaves linear-lanceolate, acuminate, tapering from the base to the apex, clasping, serrulate in the middle. Heads middle-sized, lilac. Scales of the involucre somewhat equal, linear-lanceolate; the inner colored at the apex. Achenia glabrous. *Nees.* In our specimens (from the English gardens), the heads are large and showy, and the upper leaves nearly or quite entire.—Probably this species (rather

than A. longifolius, *Lam.*) is the A. junceus, *Ait.:* we have specimens many years since cultivated under that name in the Liverpool botanic garden.

90. *A. squarrulosus* (Nees): stem corymbose-decompound; the branches erect, corymbose at the summit; leaves lanceolate-acuminate, somewhat clasping, sharply serrate in the middle, the upper surface scabrous next the margins; scales of the ovate involucre narrow, imbricated, with recurved summits. *Nees. Ast. p.* 86; *DC. prodr.* 5. *p.* 239. A. mutabilis, *Linn.?* ex *Nees.* A. spectabilis, *Willd. spec.* 3. *p.* 2048, & *enum.* 2. *p.* 886, fide *Nees*; not of *Ait.* A. recurvatus, *Spreng. in Schrad. jour. bot.* 2. *p.* 195, ex *Nees.*

β. albiflorus (Nees, l. c.): taller; rays white becoming somewhat violet; the disk at length deep purple.

North America.—Stem glabrous below. Leaves pale green. Achenia somewhat pubescent. Varies with the lower leaves lanceolate and rather broad, or all linear-lanceolate and narrow. *Nees.*—Under A. eminens, Nees remarks that his A. squarrulosus is perhaps only a variety of that species, but that they have retained their characters in cultivation for many years. The heads of A. squarrulosus are also said to be larger than those of A. eminens, but the rays narrower.—We have met with no native specimens: if it be the A. mutabilis, *Linn.* it has been in cultivation for more than a century. The plant from the Berlin garden has rather large loosely corymbose heads; the scales of the obovate involucre loosely imbricated in 2–3 series, linear, acute, nearly equal; the exterior herbaceous except the very base; the inner more membranaceous; all loose and at length somewhat squarrose-spreading. Achenia narrow, puberulent-scabrous. The cauline leaves are 3 to 4 inches long, 6 to 10 lines wide; the lower narrowed at the base. It appears like a mere variety of A. longifolius.—From this, A. argutus, *Nees,* of unknown origin (described from specimens cultivated in the gardens of Bonn and Breslau), seems not greatly to differ.

91. *A. asper* (Nees): stem paniculate-compound above, glabrous, rough with minute tubercles; the branches racemose-corymbose; leaves oblong-lanceolate, acuminate, partly clasping, scabrous above, all serrate in the middle; scales of the involucre imbricated, with squarrose-spreading summits. *Nees, Ast. p.* 84.

North America? Described from specimens derived originally from the Berlin botanic garden.—Leaves thick, firm, deep green; the cauline considerably attenuate at the base, the margins undulate-reflexed, with 3–6 distant acute teeth in the middle; the apex produced into a long entire acuminate point. Involucre turbinate, half the length of the disk; the scales imbricated in a triple series, linear-spatulate, ciliate; the base appressed, with broad membranaceous margins; the rather obtuse summit green, thickish, squarrose-spreading, somewhat 3-nerved. Rays copious, almost in a double series, pale blue or lilac: the disk yellow, turning brownish. Achenia obovate-cuneiform, obsoletely puberulent. *Nees.*—The species is arranged near A. Novi-Belgii.

92. *A. brumalis* (Nees): stem glabrous, racemose; the heads somewhat solitary on the branches; leaves lanceolate, acuminate, partly clasping, sharply appressed-serrate in the middle, the margins scabrous; scales of the involucre loose, somewhat equal. *Nees, Ast. p.* 70; *DC. prodr.* 5. *p.* 236. A. lævigatus, *Lam. dict.* 1. *p.* 307, fide *Nees.* A. Novi-Belgii & A. serotinus (partly), *Willd. spec.* 3. *p.* 2048, & *enum.* 2. *p.* 886, fide *Nees.*

North America? (Indigenous on the banks of the Main near Sickerhausen; probably derived from North America. *Nees.*) Oct.–Nov.—Primordial leaves spatulate, entire, glabrous, with a short and broad petiole, half an inch long; the succeeding oblong and oblong-lanceolate, clasping by the narrowed

base; the margin entire or remotely denticulate, somewhat shining, obtuse, with a mucronate point; the others lanceolate, acute, serrulate with minute appressed callous teeth. Heads large: rays blue. Achenia puberulent. *Nees.*—According to Nees, this is the A. Novi-Belgii of many gardens: it has been, perhaps, derived from that species.

93. *A. luxurians* (Nees): stem paniculate; the branches corymbose-racemose at the summit; branchlets bearing single heads; leaves oval-oblong or lanceolate, acuminate, narrowed at the base, clasping, sharply serrate in the middle, scabrous and glaucescent above; scales of the involucre loosely imbricated, linear-lanceolate, acute. *Nees, Ast. p.* 83; *DC. prodr.* 5. *p.* 238. A. prenanthoides, *Nees, synops. p.* 23; *Link, enum.* 2. *p.* 330.

β. stem more compound, and more hairy in lines. *Nees, l. c.*—A. luxurians, *Spreng. syst.* 3. *p.* 538 (excl. syn.), ex *Nees.*

North America? *Sprengel.* (Nees, probably supposing this to be the A. Novi-Belgii of Pursh as well as of Nuttall, has copied from the former the habitat: "In hedges and old fields, New England to Virginia; Aug.–Oct.", although the synonym of Pursh is not adduced. He states also that he has seen native specimens from Virginia.)—Root creeping, stoloniferous. Stem 2 feet or more in height, glabrous or more or less hirsute with decurrent lines, with spreading branches at the summit; the branches corymbose-divided; the branchlets spreading, leafy, bearing single heads. Leaves approximate, 2½ to 3 inches long, an inch wide, sharply but not coarsely serrate in the middle, sessile and somewhat clasping by the narrowed base, smooth and paler beneath, densely but obsoletely reticulated with slender veins; those of the branches and branchlets similar to the cauline ones, but diminished in size, less tapering at the base, and entire. Heads, including the lilac (at length deep violet) rays, an inch in diameter. Involucre shorter than the disk; the scales in several series, erect-imbricate, thickish, unequal, linear-lanceolate, rather broad, acute, the base and ciliate margin thin and whitish, with a spatuliform herbaceous disk. Achenia glabrous. *Nees.*—This appears, as well from the description as from our imperfect (cultivated) specimens, to be perhaps too closely allied to our A. prælatus.

94. *A. adulterinus* (Willd.): stem paniculate-decompound from the base; the branches corymbose-racemed; leaves oblong-lanceolate, mucronate, clasping, smooth, the margin scabrous; scales of the obovate involucre somewhat equal, spatulate-lanceolate, squarrose, enlarged after flowering. *Nees.*—*Willd. enum.* 2. *p.* 884; *Nees, Ast. p.* 85: *DC. prodr.* 5. *p.* 238.

North America. Sept.—Stem 1½ to 2 feet high, hairy in decurrent lines. Leaves lanceolate, clasping, somewhat shining, the lower slightly serrate, with scabrous margins; those of the branchlets nearly linear, squarrose-spreading. Scales of the involucre linear-cuneate, squarrose-spreading. Rays pale violet; the disk yellow, turning brownish. *Willd.*—Heads middle-sized, at first white, then pale violet. Achenia glabrous. Perhaps a variety of A. Novi-Belgii. *Nees.*—The A. adulterinus, *Hook. fl. Bor.-Am.* from the coast of Oregon (*Dr. Scouler!*) is probably a different species; but the specimens are insufficient for satisfactory determination. Our specimen of A. adulterinus from the Berlin garden differs very little from the A. tardiflorus from the same and other gardens.

95. *A. tardiflorus* (Linn.? Nees): stem glabrous, divaricate-corymbose; leaves oblong-lanceolate, obliquely clasping, serrate towards the apex, the margins scabrous; those of the branchlets obtuse; scales of the involucre imbricated, squarrose-spreading, thick; the exterior often elongated and somewhat radiant. *Nees.—Linn. spec.* (*ed.* 2) 2. *p.* 1231, ex descr. (but according to Lindley, the plant of the Linnæan herbarium is A. patulus, *Lam.*); *Ait. Kew.* (*ed.* 1) 3. *p.* 209? *Willd. spec.* 3. *p.* 2049; *Nees, Ast. p.* 78; *DC.! prodr.* 5. *p.* 238. A. tardiflorus *β.* cæspitosus, *Lindl.! in DC. l. c.* A.

cæspitosus, *Hort.* A. adulterinus, *Lindl. bot. reg. t.* 1571. Symphotrichium unctuosum, *Nees! Ast. p.* 135.

North America. (?) According to Pursh, it is found "in overflowed grounds from New York to Virginia; rare: Oct.–Nov."—But, notwithstanding the annexed *v. v.* we greatly doubt if Pursh ever met with this plant in North America: the phrase he gives is composed of the Linnæan description combined with that of Aiton.—This species is remarkable for its very corymbose habit, thickish or somewhat succulent very smooth leaves (the upper cauline and those of the branches mostly entire), and the thick and foliaceous exterior scales of the involucre, which resemble the leaves of the branchlets. Heads middle-sized. Rays lilac. Achenia nearly glabrous. Bristles of the pappus slightly united at the base, and separable from the achenium in the form of a ring.

96. *A. mutabilis* (Linn.): leaves lanceolate, serrate; involucre squarrose; panicle somewhat fastigiate. *Linn. spec.* (*ed.* 2) 2. *p.* 1230.

North America.—The specific phrase in the first edition of the Species Plantarum is merely "A. foliis lanceolatis, calycibus imbricatis basi squarrosis"; and the only synonym adduced is, "A. cæruleus Americanus non fruticosus serotinus angustifolius, flore amplo floribundus," *Pluk. alm. p.* 56, *t.* 326, *f.* 1. (which represents a narrow entire-leaved plant with small heads): to this Linnæus adds, that it differs from A. serotinus (but he has no A. serotinus!) in the more closely imbricated involucre, the deep purple rays; and that the disk-flowers, at first yellow, change to purple. In the second edition, Linnæus adds the synonym 'A. Novi-Belgii latifolius paniculatus, floribus saturate violaceis," *Herm. Lugd.* 65. *t.* 67; and compares it with A. Tradescanti, adding to the former remarks, that it may readily be distinguished by the recurved-squarrose leaves of the peduncles and involucre, the exterior scales of the latter not larger than the others.—The A. mutabilis of the Hortus Kewensis is thus characterized: "Leaves somewhat clasping, lanceolate, serrate, smooth, tapering below; branchlets virgate; calyx somewhat foliaceous, lax; stem glabrous." *Ait. l. c.* Nees cites Aiton's plant both under his own A. mutabilis and under a variety of his A. eminens; while he adduces the synonym of Linnæus, with a query, to his A. squarrulosus, which, however, he suspects (*Ast. p.* 89) may be no more than a variety of A. eminens. Our specimen of A. mutabilis from the Berlin garden appears not to differ essentially from the A. squarrulosus of the same garden, except that it is a stouter plant: we have met with no indigenous specimens of either. The A. mutabilis of Lindley, &c., and probably of Nees, we take to be a form of A. lævis.

97. *A. versicolor* (Willd.): stem paniculate-compound; the branches simply corymbose at the summit, dense; leaves oblong-lanceolate, acuminate, very smooth, of the same color both sides; the lower serrate in the middle, the upper clasping, entire; scales of the involucre imbricated, lanceolate. *Nees.—Willd. spec.* 3. *p.* 2045, & *enum.* 2. *p.* 885; *Nees, Ast. p.* 127; *DC. prodr.* 5. *p.* 246.

North America, *Willdenow.*—"Upper leaves entire, the lower with a few serratures, glabrous; the radical oblong, tapering at each end, serrate in the middle. Flowers very showy, considerably crowded at the summit of the branches. Disk yellow. Rays large, at first white, afterwards deep violet, so that the plant exhibits both violet and white flowers at the same time, which has a very pleasing effect." *Willd.*—Scales of the involucre, as in A. mutabilis, triangular-lanceolate, narrow. Achenia puberulent. *Nees.*—We have met with no indigenous Aster which accords with the A. versicolor of the Berlin garden; and we know not what plant Pursh had in view, to which he assigns the habitat: "In old fields and on the borders of woods, New Jersey to Carolina." Elliott remarks that the plant which passes under

that name has small flowers, and is therefore not so ornamental as Willdenow represents.

98. *A. confertus* (Nees): stem robust, smooth, somewhat corymbose-decompound at the summit; the branches corymbose and much crowded; leaves oblong-lanceolate, acuminate, with a cordate-clasping base, appressed-serrate in the middle, the margins scabrous; involucre imbricate. *Nees, Ast. p.* 126; *DC. prodr.* 5. *p.* 245; not of *Desf.*

North America. (Cultivated in the Botanic garden at Bonn.)—The heads are said to be middle-sized; and the rays white, not changing to violet, as in A. versicolor, under which name it is cultivated in some gardens, according to Nees. Achenia glabrous.

99. *A. strictus* (Poir.): stem glabrous, strict, racemose-decompound; the branches strict, coarctate; leaves lanceolate, attenuate, partly clasping, somewhat serrate in the middle, scabrous towards the margins; involucre closely imbricated. *Nees.—Poir. suppl.* 1. *p.* 498; *Nees, Ast. p.* 124; *DC. prodr. p.* 245. (excl. *β.*)

North America.—"Resembles A. prælatus; from which it differs by its shorter branches: the leaves more (appressed-) scabrous towards the margins; the larger heads; the closely imbricated involucre, which is scarcely subsquarrose even in the terminal head; the narrow, elongated and somewhat distant lilac-colored rays, which in that species are paler, a little shorter, and approximate." *Nees.* This author however does not place it in the section which includes A. prælatus, but with his Concinni, between A. Chilensis and A. mutabilis. We have seen no specimens. The A. strictus *β.*, *Lindl. in Hook. fl. Bor.-Am.* appears not sufficiently different from the A. laxifolius of the same work.

100. *A. onustus* (Nees): stem racemose-compound, decurved; the branches lax, racemose at the summit; leaves tapering to each end, partly clasping, appressed-serrate in the middle, the margins scabrous; heads somewhat secund, on short pedicels; scales of the short involucre imbricated, lanceolate, scarcely equalling the disk. *Nees, Ast. p.* 122; *DC. prodr.* 5. *p.* 245. A. confertus, *Desf. cat. hort. Par. ed.* 3. *p.* 401, not of *Nees*, fide *DC.*

β. squarrosus (Lindl.): leaves of the branchlets linear, squarrose. (Cultivated in the English gardens under the name of A. Tradescanti cæruleus.) *Lindl. in DC. l. c.*

North America? but the origin very doubtful.—Nees compares it with his A. amplexicaulis, A. mutabilis, and A. lævigatus (all of which are probably included under our A. lævis); but states the heads to be more like those of A. luxurians. The stem is said to be 3 or 4 feet high, the summit decurved by the weight of the flowers, glabrous, or with a few scattered small bristles, or slightly hirsute in lines at the summit; the leaves smooth and lucid. Heads crowded, nodding, with copious pale blue rays; the scales of the turbinate involucre not densely imbricated, lanceolate, with a membranaceous margin, ciliate. Achenia glabrous. *Nees.*

101. *A. purpuratus* (Nees): stem somewhat simply racemose-virgate; the branches elongated and bearing single heads; leaves narrowly lanceolate, clasping, with scabrous margins, sharply serrate in the middle; the uppermost ovate-lanceolate; those of the branches numerous, lanceolate, spreading, entire, equal and equally distant; scales of the turbinate involucre imbricated, lanceolate, with colored tips. *Nees, Ast. p.* 118; *DC. prodr.* 5. *p.* 244. A. miser, *Lam. dict.* 1. *p.* 308 (excl. syn.), fide *DC.*

North America? Cultivated for many years at the Garden of Plants, Paris, under the name of A. miser.—Scales of the involucre imbricated in several series, not rigid, lanceolate-triangular, whitish at the base, with purplish tips, all similar; the inner nearly the length of the disk; the outer-

most about half that length. Rays short, erect-spreading, purple; the disk turning purple. Achenia linear-cuneiform, glabrous.—Placed by Nees at the commencement of his Concinni: Dr. Lindley compares with it his A. azureus, and A. turbinellus. We have seen no specimens.

102. *A. retroflexus* (Lindl.): stem compound-racemose; the branches short and bearing single heads; leaves linear-lanceolate, entire, very glabrous; those of the branches linear-subulate, recurved, distant; scales of the hemispherical involucre linear-lanceolate, squarrose. *Lindl.! in DC. prodr.* 5. *p.* 244.

North America.—Disk whitish, scarcely changing. Rays blue. *DC.*—We are uncertain whether this is described from cultivated or indigenous specimens. No farther particulars are given. It is placed between A. azureus and A. turbinellus.

A. serotinus, Mill. *dict. ed. Martyn*, (1797,) founded on the A. foliis oblongis acutis basi latioribus semi-amplexicaulibus, caule ramoso, floribus terminalibus plerumque solitariis (Late blue shrubby Starwort of John Tradescant, commonly called *Michaelmas Daisy*), of the earlier editions, is anterior to the A. serotinus of Willdenow, but is not cited by that author or by succeeding writers. It is said to have been brought from Virginia, and to bear "pretty large flowers, which are of a very pale bluish color, tending to white."

§ 4. *Scales of the involucre nearly equal, loose, narrow, scarcely or slightly imbricated, more or less herbaceous: receptacle naked, scrobiculate: appendages of the style triangular, short: pappus of capillary bristles: rays numerous: stems often low and simple, bearing solitary or few large heads.* —Oritrophium, Kunth, *excl. spec.?* (Ast. Alpigeni, *Nees*, *DC.*)

103. *A. alpinus* (Linn.): pubescent or hairy; stem bearing a single head; leaves entire, 3-nerved or tripli-nerved, obtuse; the radical ones spatulate, the cauline lanceolate; scales of the involucre loose, about the length of the disk, oblong-linear, obtuse or obtusish, ciliate and pubescent.—*Linn. spec.* 2. *p.* 872; *Jacq. fl. Austr. t.* 88; *Bot. mag. t.* 199; *Nees, Ast. p.* 26; *Hook.! fl. Bor.-Am.* 2. *p.* 6; *DC.! prodr.* 5. *p.* 227.

On the higher Rocky Mountains, in lat. 54°, *Drummond!*—Heads, with the blue rays, 1½–2 inches in diameter, showy. Radical leaves petioled.—The American plant resembles Siberian forms.

104. *A. pygmæus* (Lindl.): villous; stem bearing a single head; leaves at length nearly glabrous, obtuse, entire, 1-nerved or obscurely 3-nerved; the radical ones spatulate-oblong or oblanceolate; the cauline lanceolate; scales of the very villous involucre linear, obtuse, squarrose-spreading.—*Lindl.! in Hook. fl. Bor.-Am.* 2. *p.* 6, & *in DC. prodr.* 5. *p.* 228.

Arctic sea-coast, *Richardson!*—Plant about 2 inches high. Head large for the size of the plant; the rays scarcely twice the length of the involucre.—Smaller specimens of A. intermedius, *Turcz.!* (A. Argunensis, fide *DC.*) scarcely differ from this species, except in their longer rays and more hirsute pubescence.

105. *A. Andinus* (Nutt.): rhizoma slender and creeping; stems several, decumbent, above pubescent, mostly bearing a single head; leaves glabrous, entire; the radical spatulate or somewhat lanceolate; the cauline nearly linear, acute, usually wider at the base and clasping; scales of the involucre linear, nearly glabrous, ciliate, mostly acute; rays numerous, rather long; achenia nearly glabrous.—*Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 290.

Rocky Mountains at Thornberg's Ridge, near the line of perpetual snow in lat. 42°, about 10,000 feet above the level of the sea, *Nuttall!*—Root wiry

and slender, sending up small clusters of decumbent stems, 3–4 inches high. Leaves scarcely an inch long, rather coriaceous. Head about half as large as in A. alpinus.

106. *A. glacialis* (Nutt.): rhizoma thickish, not creeping; stem low, erect, minutely pubescent above, often nearly leafless, bearing a single head; leaves spatulate-oblong and lanceolate, entire, glabrous, obscurely 3-nerved; the cauline small, acute, partly clasping; scales of the involucre numerous, linear-subulate, glandular-puberulent, appressed, about the length of the disk. —*Nutt.! l. c. p.* 291.

Rocky Mountains, with the preceding. *Nuttall!*—Stems about 3 inches high, bearing 2–3 small leaves, and a head about the size of the preceding, but with broader and shorter rays. Radical leaves 1–2 inches long, thickish, with somewhat scabrous margins. Pappus strongly scabrous. Involucre much like that of A. salsuginosus, brownish, somewhat viscid.

107. *A. salsuginosus* (Richards.): stem simple, leafy, bearing 1 to 3 heads, pubescent above with appressed hairs; leaves linear-obovate and lanceolate, apiculate-acuminate, mostly entire, veiny, somewhat pubescent; the radical and lower cauline tapering into a margined petiole, the upper sessile and partly clasping; scales of the involucre narrowly linear or linear-subulate, pubescent, nearly equal, lax, with mostly squarrose-spreading or recurved tips; achenia somewhat hairy.—*Richards. in appx. Frankl. journ. p.* 749, *& ed.* 2. *p.* 32; *Spreng. syst.* 3. *p.* 527; *Nees, Ast. p.* 29; *Hook. & Arn. bot. Beechey, p.* 126; *DC. prodr.* 5. *p.* 229. A. salsuginosus, *β. Hook.! fl. Bor.-Am.* 2. *p.* 6. A. Unalaschkensis, *Less. in Linnæa*, 6. *p.* 124; *Nees, Ast. p.* 34; *Bongard! veg. Sitcha, l. c. p.* 148; *DC.! prodr.* 5. *p.* 228.

β. stem stouter and larger, often bearing 3–5 heads; lower and radical leaves broadly spatulate or obovate; the upper oblong-ovate or ovate-lanceolate; scales of the involucre somewhat glandular.—A. salsuginosus (*a.*) *Hook.! bot. mag. t.* 2942, *& fl. Bor.-Am.* 2. *p.* 6; *Hook. & Arn. bot. Beechey, suppl. p.* 350.

Subarctic America, from the salt plains of the Athabasca, *Richardson!* and the Rocky Mountains, *Drummond!* to Kotzebue's Sound! the N. W. Coast! Unalaschka! Sitcha, and the interior of California (Oregon?), *Douglas!*—Plant 6 to 18 inches high, with a thickish rhizoma, and large heads (the peduncles thickened at the summit); the rays 30 or more, 6 to 8, or even 10 lines long, purple? Radical and lower leaves 3–5 inches long, including the margined petiole, varying from 3 lines to an inch in width, nearly glabrous when old. Pappus densely scabrous.—In all the specimens we have examined, the scales of the involucre are in fact nearly the length of the disk, although their recurved summits cause them to appear much shorter. In the A. Unalaschkensis, the involucre is more pubescent or hairy, and scarcely glandular or viscid, and less recurved. The specimens from the North West Coast, collected by Mr. Menzies, are intermediate in this respect.

108. *A. peregrinus* (Pursh): stem somewhat simple, erect, glabrous, hirsute above, bearing 1–3 heads at the summit; leaves sessile, remote, oblong-lanceolate, gradually acute, glabrous; scales of the involucre lanceolate-linear, very acute, villous, loose, as long as the disk; rays numerous (heads large, violet). *Pursh, fl.* 2. *p.* 556; *DC. prodr.* 5. *p.* 228. "A. Tilesii, *Wikstr. in act. Holm.* 1822. *p.* 13," fide *Nees & DC.*

North West Coast; Unalaschka, *D. Nelson, Pursh.* (Norfolk Sound, *Eschscholtz!*)—We copy the character from Pursh, since Chamisso's plant from Unalaschka, which Lessing has described under this name, De Candolle inclines to refer to A. foliaceus, *Lindl.*; the description of Nees is drawn from Chamisso's plant; while that of Bongard from Sitcha is supposed to be

the same. We have a fragment collected by Eschscholtz which accords with Pursh's character.

109. *A. foliaceus* (Lindl.): stem simple? racemose; leaves oblong-lanceolate, clasping, somewhat serrate, glabrous; heads terminating the axillary branchlets; scales of the involucre spreading, foliaceous, glabrous. *Lindl. in DC. prodr.* 5. *p.* 228. A. peregrinus, *Less. in Linnæa, l. c.?* ex *DC.*

Unalaschka, *Fischer.*—Species remarkable for the scales of the involucre, which resemble the rameal leaves: peduncle tomentose. *DC.*—De Candolle also remarks that in his own specimen, likewise received from Fischer, the scales of the involucre are erect instead of spreading, ciliate instead of entirely glabrous; the leaves obtuse at the base; the stems slightly hairy, with the hairs here and there somewhat in lines.

110. *A. graminifolius* (Pursh): slightly pubescent with minute scattered hairs; leaves very numerous, narrowly linear; stems slender, branched at the summit; the branches somewhat corymbose, simple, prolonged into slender naked peduncles terminated by single (small) heads; scales of the involucre linear-subulate, loose, scarcely in a double series, nearly the length of the disk; achenia minutely hairy.—*Pursh, fl.* 2. *p.* 545; *Richards.! appx. Frankl. journ. ed.* 2. *p.* 32; *Lindl.! in DC. prodr.* 5. *p.* 227. Galatella graminifolia, *Hook.! fl. Bor.-Am.* 2. *p.* 15. Erigeron hyssopifolium, *Michx.! fl.* 2. *p.* 123.

Hudson's Bay, *Michaux! & Herb. Banks*, to Slave Lake, *Richardson!*—Stem 6–12 inches high, clothed like the leaves with minute and often sparse somewhat strigose hairs; the simple branches leafy like the stem below; the upper portion, or peduncle, leafless or nearly so, 2–3 inches long. Leaves an inch or more in length, acute or mucronulate, with a conspicuous midrib, and the broader ones presenting lateral veinlets or ramified nerves. Heads about a third of an inch in diameter; the involucre resembling an Erigeron. Rays 15–25, fertile, purple or rose-color, much longer than the disk. Appendages of the style very short, triangular. Achenia narrow, compressed, scabrous-hirsute under a lens.—This plant bears no small resemblance to Aster roseus, *Stev.* (Calimeris rosea, *DC.*); which, however, has larger heads, broader and more unequal and imbricated scales of the involucre, silky-villous achenia, &c.

§ 5. *Scales of the regularly imbricated involucre with membranaceous or scarious margins, destitute of herbaceous tips or appendages, often carinate, mostly unequal: appendages of the style lanceolate, sometimes oblong or triangular: receptacle alveolate (flat): bristles of the pappus capillary, usually unequal.*—ORTHOMERIS. (Calimeris, *Nees, Lindl., DC.*, in part; not of *Cass.* Species of Heleastrum, *DC.* Eucephalus, Xylorhiza, & Galatella § Calianthus, *Nutt.*)

The original Calimeris (Kalimeris platycephala, *Cass.*, or C. incisa, *DC.*) is distinguished by its *conical receptacle*, which is obscurely alveolate, its *broad and flat margined achenia*, and a *pappus of short setaceous-subulate* bristles, none of which exceed in length the proper tube of the (disk) corolla. C. integrifolia, *Turcz.!* presents the same characters; but, having narrow entire leaves, it accords in habit with C. Altaica and C. canescens, *Nees*, C. Tartarica, C. exilis, &c. of Lindley, and C. rosea, *DC.* But all the latter have a flat, or at most slightly convex, receptacle, narrower achenia without distinct margins, and a capillary pappus which is never much shorter than the corolla. These, in connexion with the Xylorhiza and a part of Eucephalus of Nuttall, the Aster nemoralis, *Ait.*, &c. appear to form a pretty well defined subgenus, or genus, more nearly allied to Galatella (as that genus now stands) than to Calimeris, but hardly to be separated from Aster by those who would retain Tripolium as a subgenus; and A. acuminatus, *Michx.*, with

A. Tartaricus (*Linn. f.*), *DC.* will perhaps form a mere section of the same group. We are acquainted with only two species of Calimeris (thus retricted), viz. C. incisa and C. integrifolia: the genus should be placed next to Boltonia.—In Sir Wm. Hooker's herbarium, two plants (collected at Simla by Lady Dalhousie), very similar in habit and foliage, are labelled 'Calimeris flexuosa' by Dr. Lindley, neither of which altogether accords with the character given by De Candolle. Both have a broad and perfectly flat receptacle, and a loose involucre of two series of scales; the exterior larger, unequal, and more or less foliaceous. One of them has a double pappus; the inner capillary and as long as the corolla, the outer setaceous and shorter than the achenia; it therefore belongs to De Candolle's Diplopappus § Calimeridei (certainly not a congener of D. linariifolius, &c.), and is probably C. asperulus, *DC.* The other presents a simple setaceous-subulate pappus, shorter than the achenia and not exceeding the proper tube of the corolla, nearly similar to the exterior pappus of the preceding plant, which it nearly resembles. The two should doubtless be united in the same (new?) genus; to which, we may remark, the Aster peduncularis, *Wall.! cat. no.* 2967 (Amphiraphis peduncularis, *DC. prodr.*) also belongs. The pappus of the latter is manifestly double, and the rays doubtless not yellow.

* *Scales of the hemispherical involucre unequal, narrowly lanceolate or linear, loosely imbricated in* 2 *or* 3 *series: alveoli of the receptacle toothed and lacerate: appendages of the style lanceolate: achenia glandular* (*or hairy*)*: heads loosely corymbose: leaves ample, cuneiform-lanceolate, coarsely toothed towards the summit, pinnately veined.*

This section might include Aster Tartaricus, *Linn. f.*, *DC.*; which has more obtuse appendages to the style, and broader hairy achenia.

111. *A. acuminatus* (Michx.): stem simple, flexuous, pubescent or hairy, paniculate-corymbose at the summit; the peduncles slender; leaves oblong-lanceolate or cuneiform-lanceolate, conspicuously acuminate, coarsely or incisely toothed above, the narrowed base, entire, glabrous above, the margins finely ciliate; scales of the involucre lax, membranaceous, acuminate; achenia narrowly oblong, glandular.—*Michx.! fl.* 2. *p.* 109; *Pursh! fl.* 2. *p.* 555; *Bigel.! fl. Bost. ed.* 2. *p.* 312; *Hook.! bot. mag. t.* 2707, *& fl. Bor.-Am.* 2. *p.* 9; not of *Nees.* A. diffusus *var.* acuminatus, *Pers. syn.* 2 *p.* 447. Diplostephium acuminatum, *DC.! prodr.* 5. *p.* 273.

In deep rich woods, Canada! to the mountains of Virginia; not uncommon in the New England States! and New York. Aug.–Oct.—Rhizoma slender, creeping. Stem 1–2 feet high, bearing rather numerous heads in a loose paniculate corymb; or frequently flowering when only 6 inches high, and bearing very few heads; the slender peduncles and pedicels pubescent, slightly viscid, leafless, or with a few subulate bracts. Cauline leaves 3–6 inches long, membranaceous, pubescent or hairy on the veins, at length nearly glabrous. Heads from one-third to half an inch in diameter. Scales of the involucre nearly glabrous, membranaceous throughout, often purple, the innermost linear, very acute, about the length of the disk; the exterior successively shorter. Rays 12–18, elongated, white, often tinged with purple. Appendages of the anthers subulate-lanceolate. Appendages of the style subulate-lanceolate. Bristles of the pappus capillary, unequal in length, but otherwise similar.—There is no proper exterior pappus, as in Diplopappus, &c.; nor are the bristles more unequal than in many genuine Asters.

* * *Scales of the turbinate-hemispherical involucre narrowly linear-lanceolate, rather closely imbricated in about* 3 *series; the innermost scarcely as long as the disk; the exterior shorter, loose, passing into subulate bracts: alveoli of the receptacle short, denticulate: branches of the style broadly linear, terminated with a short acutish appendage: achenia obovoid-turbinate, turgid,* 6–8*-ribbed, glandular: pappus copious, obscurely scabrous: leaves crowded, lanceolate, mostly entire; the lower surface somewhat pinnately veined, minutely dotted with resinous globules: heads terminating the simple pedunculiform branches.* (Galatella § Calianthus, *Nutt.*)

112. *A. nemoralis* (Ait.): scabrous-puberulent; stem very leafy, slender, simple or corymbose at the summit; leaves somewhat rigid, lanceolate or linear, sessile, spreading, scabrous above, the revolute margins sometimes obscurely 2–4 toothed; those of the slender simple branches or peduncles subulate; rays large.—*Ait. Kew.* (*ed.* 1) 3. *p.* 198; *Willd. spec.* 3. *p.* 2021; *Nutt.! gen.* 2. *p.* 154. A. uniflorus, *Michx.! fl.* 2. *p.* 110 (stem simple). A. ledifolius, *Pursh! fl.* 2. *p.* 544. A. Greenei, *Nees! mss. in herb. Arn. & Hook.* Galatella nemoralis, *Nees, Ast. p.* 173; *Hook.! fl. Bor.-Am.* 2. *p.* 15; *DC.! prodr.* 5. *p.* 257; *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 303.

Bogs and wet places, Newfoundland, *Pylaie! Dr. Morrison! Mr. Cormack!* Nova Scotia (ex *Ait.*) and Canada (from Lake Mistassins, *Michaux!*) to Boston, *Dr. B. D. Greene!* and swamps in the pine barrens of New Jersey! Aug.–Oct.—Stem 1–2 feet high, fragile, sometimes simple and bearing a solitary head, usually with several simple and often flexuous nearly naked branches, each terminated by a head, rarely branching above. Leaves pale green, 10 to 20 lines long and 2 to 4 wide, usually acutish at each end, and tipped with a callous gland-like point; the upper surface nearly veinless; the lower with a prominent midrib and several rather strong primary veins, sprinkled (under a lens) with very numerous and minute resinous globules. Heads rather large, showy; the peduncle thickened at the base of the involucre, giving the latter a somewhat turbinate appearance. Scales of the involucre minutely pubescent, acute; the inner appressed, often purplish. Rays rather broadly linear, 8–10 lines long, pale lilac-purple, elongated; the disk-flowers pale yellow, slightly longer than the pappus. Branches of the style in the rays stigmatose throughout their whole length; the achenia of the ray-flowers fertile in all the specimens we have examined.

* * * *Scales of the broadly hemispherical involucre loosely imbricated in about 2 series, oblong or ovate-lanceolate, acuminate, carinate below, herbaceous, with scarious margins; the inner about the length of the disk, the exterior rather shorter: "receptacle flat, alveolate"* (Nutt.): *appendages of the style lanceolate, acute: achenia oblong, compressed, densely silky: pappus of copious rather rigid unequal bristles, about the length of the corolla of the disk: root or caudex woody, bearing numerous dwarf mostly simple stems, terminating in a naked peduncle: heads large, solitary: leaves thickish, entire, somewhat 3-nerved, mucronulate; the lower linear-spatulate; the uppermost linear-lanceolate.* (Xylorhiza, *Nutt.*)

We find no important character to distinguish the Xylorhiza of Nuttall from the group to which Calimeris Altaica, *Nees*, C. Tartarica, *Lindl.* &c. belong; except that the appendages of the style are narrower.

113. *A. Xylorhiza:* leaves and scales of the involucre canescently somewhat villous or tomentose, tipped with a rigid mucronate point; peduncle elongated.—Xylorhiza villosa, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 298.

Arid argillaceous tracts in the Rocky Mountains, and on rocks towards the sources of the Platte, *Nuttall!*—Root long, fusiform, perpendicular: stems 4–6 inches high, minutely pubescent. Leaves 1–2 inches long, spatulate or linear-spatulate, 2–3 lines wide towards the apex, tapering to the base. Peduncle usually solitary, 1–3 inches long. Involucre about half an inch in diameter; the scales ovate-lanceolate, with a very stout keel or midnerve, and broad scarious margins (especially the innermost), tapering into a cuspidate point. Rays 15 or more, large, much longer than the disk, "pale red." (*Nutt.*) Pappus brownish, somewhat strongly scabrous.—The (tomentose rather than villous) pubescence appears as if deciduous, in which case it will probably be difficult to distinguish this species from the following.

114. *A. glabriusculus:* lower leaves pubescent; the upper nearly glabrous, linear-lanceolate, acute; peduncles solitary or 3–5 together, short.—Xylorhiza glabriuscula, *Nutt.! l. c. p.* 297.

With the preceding, *Nuttall!*—The lower leaves (about 2 inches long, linear-spatulate, are sparsely clothed with a similar pubescence as the preceding; and the scales of the involucre are nearly glabrous, with more membranaceous points: the scarious margins are somewhat denticulate-ciliate in both. The rays are said to be pale rose-color.

* * * * *Scales of the turbinate-campanulate involucre regularly imbricated in* 3 *to* 4 *series, ovate, concave, somewhat carinate* (*acute or obtuse*)*; the innermost about the length of the disk; the exterior successively shorter, but similar: alveoli of the receptacle lacerate: appendages of the style lanceolate, acute: achenia oblong, compressed, villous: pappus copious, rather longer than the corolla; the bristles unequal, a few of the longest often obscurely thickened towards the summit: stems several from a woody root, simple, very leafy: leaves lanceolate, entire, somewhat rigid: heads* (*rather small*) *in contracted corymbs.* (Eucephalus, *Nutt.*, excl. spec. no. 2 & 4.)

Mr. Nuttall's first species, Eucephalus elegans, is much more allied to the third, E. (§ Lagatea) glaucus, than to his E. albus. The fourth, E. ericoides, is a Diplopappus. The two plants here retained, if we except their fertile rays and narrow appendages to the style, accord in habit and character with such impunctate species of Galatella as G. Hauptii and G. leptophylla; both of which, it may be remarked, but especially the former, have the innermost series of the pappus much more evidently clavate than E. elegans, *Nutt.*

115. *A. elegans:* stems minutely puberulent; leaves narrowly lanceolate, closely sessile, pale, minutely scabrous, especially the margins, somewhat 3-nerved; heads in a contracted corymb; scales of the obovate-turbinate involucre ovate, acute, pubescent, with ciliate-fringed margins; rays few (6 or 7, *Nutt.* to 10).—Eucephalus elegans, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 298.

Plains of the Oregon, and in the Blue Mountains, *Nuttall!* Sept.–Oct.—Stems 2–3 feet high, clothed with numerous erect leaves, which are 1 to 2 inches long and 4 to 6 lines wide, gradually becoming smaller towards the summit of the stem, with scabrous margins; the surfaces also minutely scabrous with close hairs and obscure dots. Scales of the involucre rigid, pale, tinged with purple; the narrow scarious margins densely laciniate-fringed under a lens; the inner rather shorter than the disk. "Rays pale purple," (*Nutt.*); the disk-flowers 15–20. Appendages of the anthers narrowly lanceolate. Bristles of the pappus unequal; the inner series very obscurely thickened towards the apex.

116. *A. glaucus:* very smooth, pale and somewhat glaucous; stem often branching above; leaves oblong-linear, closely sessile, 1-nerved, reticulate-veined; heads in contracted corymbs, or somewhat racemose; scales of the campanulate involucre oval, obtuse, glabrous, slightly ciliate; the innermost lanceolate, membranaceous, acute, as long as the disk; "rays about 14," *Nutt.*—Eucephalus (§ Lagatea) glaucus, *Nutt.! l. c. p.* 299.

Rocky Mountains, about lat. 42°, and towards the sources of the Platte, *Nuttall!*—Stem 12 to 18 inches high. Leaves 2 to 3 inches long, and 4 to 6 lines wide, somewhat coriaceous, both sides of a similar pale hue; the margins scarcely scabrous; the lowest narrowed at the base. Heads rather smaller, and the scales of the involucre fewer than in the preceding, pale. Ovaries minutely pubescent. Bristles of the pappus not at all thickened at the apex.—Manifestly allied to the preceding: our specimens are immature, with the rays undeveloped.

* * * * * *Scales of the somewhat hemispherical involucre closely imbricated in* 3–4 *unequal series, shorter than the disk, oblong, obtuse; the exterior somewhat carinate, passing into subulate bracts; the interior with broad membranaceous margins: alveoli of the receptacle entire: appendages of the style lanceolate: achenia oblong, very glabrous: pappus copious, as long as the corolla, unequal; the longer bristles clavellate-thickened at the apex: stems simple: leaves linear-lanceolate, rigid, scabrous: heads (rather small) corymbose.* (Species of Heleastrum, *DC.*)

117. *A. ptarmicoides:* stems several from a somewhat woody rhizoma, scabrous above; leaves linear-lanceolate, acute, somewhat shining, smooth or scabrous, with very scabrous margins, entire; the lower elongated, often slightly and remotely toothed, tapering to the base or somewhat petioled; corymb fastigiate, simple or compound; scales of the involucre rather obtuse; rays 12–18, linear-oblong, short.—Chrysopsis alba, *Nutt.! gen.* 2. *p.* 152. Dœllingeria ptarmicoides, *Nees, Ast. p.* 183. Diplopappus albus, *Hook.! fl. Bor.-Am.* 2. *p.* 21; *Gray! in ann. lyc. New York*, 3. *p.* 226. D. ptarmicoides, *Lindl.! in herb. Torr., &c.* Heleastrum album, *DC. prodr.* 5. *p.* 264, excl. syn. Aster albus, *Willd.?* Eucephalus albus, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 299.

β. heads few or solitary. (*Lindl.! in DC. l. c.*)

γ. leaves nearly all furnished with 3 or 4 sharp spreading teeth on each side; stem very scabrous above; inner scales of the involucre rather broader.—Heleastrum album *γ. DC. l. c.* (*Lindl.!*)

Dry soil, or rocky banks of streams, from the Missouri, near Fort Mandan! to Saskatchawan! Lake Superior! Wisconsin! Michigan! Upper Canada along the Great Lakes! to the banks of Black River, Jefferson County, New York! and Pownal, Vermont, *Mr. Robbins!*—July–Sept.—Stems 6–18 inches high, rigid, leafy, scabrous, especially above, with a minute somewhat strigose pubescence. Leaves rigid, with serrulate-scabrous margins, or often sparsely ciliate towards the base, with a strong midrib and two more or less distinct lateral nerves, anastomozing towards the summit; the radical and lowermost 3 to 6 inches long, 3–4 lines wide, linear-lanceolate, or oblanceolate, tapering gradually into a more or less distinct petiole; the upper successively shorter and less narrowed at the base; those of the branches scattered, linear-subulate. Corymb spreading. Involucre nearly glabrous, greenish; the outermost scales somewhat lanceolate-subulate; the inner more membranaceous, narrowly oblong, slightly ciliate, shorter than the disk. Rays pure white. Pappus soft, white.—It is not probable that this is the Aster albus, *Willd. herb. & Spreng.*, a species of unknown origin, which is said to have oblong-lanceolate, rather obtuse and nerveless leaves, leafy branches, and elongated rays.—This plant has little agreement with De Candolle's Heleastrum paludosum, besides the clavellate pappus; a character which equally exists in some other divisions of Aster, in a few species of Galatella, &c.

118. *A. lutescens:* pubescent-scabrous throughout; leaves lanceolate, acute, scarcely nerved; the lower elongated and tapering into a petiole, somewhat serrulate; the upper short, oblong-linear; corymb simple or rather compound; scales of the involucre oval or oblong, very obtuse, minutely pubescent; rays ochroleucous?—Diplopappus lutescens, *Lindl.! in DC. prodr.* 5. *p.* 278. D. albus *β.* lutescens, *Hook.! fl. Bor.-Am.* 2. *p.* 21.

Saskatchawan, on dry elevated grounds of the Assiniboin River, *Douglas!*—Plant with the habit of the preceding (a foot high), everywhere covered with a similar, but denser, rough pubescence. Lower leaves 5–6 inches long, 5 lines wide; both surfaces scabrous-pubescent, and not shining: the upper cauline an inch or less in length, and broader in proportion. The involucre is as long as the disk (but the flowers are not fully developed, so that this

character may not be relied upon), and the scales are broader than in the preceding. Mr. Douglas has labelled his specimens, "flower yellow", but the rays appear to have been at most only ochroleucous. If this be the case, it is doubtless a distinct species; if not, it may prove to be only a variety of the preceding, as Hooker supposes.

§ 6. *Scales of the involucre imbricated in few–several series, membranaceous or chartaceous with scarious margins, destitute of herbaceous tips, usually very acute; the exterior shorter and passing into scale-like bracts: receptacle somewhat alveolate: rays numerous (rarely even in a double series): appendages of the style subulate from a broad base, or triangular, acute: bristles of the pappus soft and capillary, nearly equal: achenia compressed, often striate: annual or perennial, mostly glabrous, and natives of salt marshes: leaves thickish or succulent, narrow, usually entire.*—OXYTRIPOLIUM, DC., under Tripolium. (Tripolium ('or perhaps sect. of Aster,') § Astropolium, *Nutt.*)

* *Scales of the involucre regularly and closely imbricated in numerous series: rays exserted, in a single series (heads large): perennial.*

119. *A. Chapmanii:* very glabrous; stems simple or branched at the base, long and slender, strict, somewhat corymbose at the summit; the filiform branches terminated by single (large) heads; leaves numerous, linear-subulate, appressed, those of the branches reduced to subulate bracts; scales of the broadly obconical involucre closely and regularly imbricated in 5 or 6 series, slightly pubescent, ovate-oblong, acute or acuminate, the exterior successively shorter; rays elongated; achenia oblong, compressed, very glabrous.

In swamps, Middle Florida, *Dr. A. W. Chapman!*—Stems 2 feet or more in height, virgate, not in the least flexuous, striate with lines produced from the midrib of the leaves. Lower leaves 3–4 inches long; the cauline about a line wide at the appressed base, tapering to the subulate apex, successively reduced upwards to half an inch or less in length, rather rigid, but not fleshy, smooth on the margins; the uppermost sometimes ciliate. Heads as large as in A. flexuosus; the scales of the involucre broader (the exterior triangular-ovate), brownish, with a very narrow but distinct and abrupt scarious margin. Rays 20 or more, large (three-fourths of an inch long), apparently bluish-purple. Corolla of the disk sparsely pubescent below with minute jointed hairs. Appendages of the style ovate-triangular, acute, flat, as long as the oblong stigmatic portion. Pappus capillary, nearly in a single series, as long as the corolla of the disk. Alveoli of the receptacle toothed.—A very remarkable species.

120. *A. flexuosus* (Nutt.): very smooth and glabrous; stem flexuous, dichotomous; the branches mostly terminated by (large) solitary heads; leaves linear-subulate, thick and fleshy; the lower linear-lanceolate, acute, tapering to the base; those of the branchlets reduced to subulate-acuminate scale-like bracts; scales of the obovate involucre lanceolate or ovate-lanceolate, subulate-acuminate, unequal, imbricated in several series; rays numerous, rather short; achenia slender, sparsely pubescent, strongly 5-striate.—*Nutt.! gen.* 2. *p.* 154; *Ell.! sk.* 2. *p.* 343. A. sparsiflorus, *Pursh! fl.* 2. *p.* 547, not of *Michx.* A. Tripolium? *Walt. Car. p.* 154. Tripolium flore unico caulem terminante, &c. *Clayt.! fl. Virg. ed.* 1. *p.* 99. T. flexuosum, *Nees, Ast. p.* 155; *DC.! prodr.* 5. *p.* 254.

Salt marshes, Massachusetts! and Connecticut! to Georgia! and Florida!

Sept.–Oct.—Stem erect or ascending, 6–20 inches high; the whole plant very smooth, with a somewhat glaucous hue. Leaves succulent, 3–6 inches long; those of the branches reduced to ovate-subulate acuminate bracts, passing into the chartaceous regularly imbricated scales of the involucre. Heads few, about half an inch in diameter. Rays about 20, pale purple, oblong-linear, moderately exserted. Achenia oblong-linear.

* * *Scales of the involucre in* 2–3 *series: rays more or less distinctly in a double series, very short; the ligules scarcely exceeding the pappus, or sometimes wanting: annual.* (Conyzopsis.)

121. *A. angustus:* stem strict; the branches erect, racemose; leaves linear, acute, ciliate-serrulate; scales of the hemispherical involucre linear, acute, in about 2 series, somewhat equal; ligules extremely short, or wanting; achenia densely and minutely hirsute-pubescent.—Tripolium angustum, *Lindl.! in Hook. fl. Bor.-Am.* 2. *p.* 15, & *in DC. prodr.* 5. *p.* 254.

Saskatchawan, and towards the Rocky Mountains, *Drummond!* Slave Lake, *Richardson!*—Plant a foot or more in height, with numerous strict branches, glabrous or nearly so, except the serrulate-ciliate or ciliate-scabrous margins of the slender leaves. Heads as large as in the following, racemose (either few or numerous) on the branches. Exterior scales of the involucre nearly or entirely destitute of membranaceous margins. Ray-flowers in two series; the corolla shorter than the capillary pappus, with an extremely short ligule (shorter than the style), or frequently reduced to a slender truncate tube (as in Conyza, &c.), which is often much shorter than the style. Corolla of the disk also slender.

122. *A. linifolius* (Linn.): very smooth and glabrous; stem erect, racemosely branched or compound; the branches erect-spreading, bearing numerous racemose or paniculate heads; leaves linear or narrowly lanceolate, attenuate-acute or acuminate, entire; the lowermost tapering into a petiole; those of the branches subulate; scales of the cylindraceous involucre linear-subulate, unequal, in about 3 series; ray-flowers somewhat in two series; the ligules scarcely exceeding the pappus; achenia narrow, minutely pubescent.—*Linn.! hort. Cliff. p.* 408, & *spec.* 2. *p.* 874 (excl. syn. *Gronov.*); not of *Ait., Willd., &c.* A. subulatus, *Michx.! fl.* 2. *p.* 111 (partly); *Nutt.! gen.* 2. *p.* 154; *Ell.! sk.* 2. *p.* 345; *Bigel.! fl. Bost. ed.* 2. *p.* 309. A. longifolius, *Desf. cat.? Poir. suppl.* 1. *p.* 480 *?* Tripolium subulatum, *Nees, Ast. p.* 156 (in part); *DC. prodr.* 5. *p.* 254, partly.

Salt marshes, Massachusetts! to South Carolina! Sept.–Oct.—Stem 1–3 feet high, stout, erect, usually much branched, with numerous paniculate or corymbose-paniculate heads, which are 4 to 5 lines in length. Leaves rather fleshy; the lower 4 to 6 inches long, 3 to 4 lines broad, narrowed below, partly clasping, obscurely veined. Scales of the involucre very acute, the inner fully as long as the disk. Ray-flowers about 30, with very short purplish-white ligules, often shorter than the capillary pappus; the disk-flowers fewer. Pappus in a single series. Receptacle almost naked. Involucre reflexed after the fruit is mature.—The A. subulatus of Michaux, as well as the Tripolium subulatum of subsequent authors, doubtless includes both this and the following species; but Michaux's character is at least partly derived from the present species, which moreover is alone found so far north as Pennsylvania. But if we may rely upon our memoranda respecting the specimens in the herbarium of the Hortus Cliffortianus, and upon their authenticity, the plant here described is the original A. linifolius (the A. foliis linearibus acutis, caule corymbose ramosissimo, *Linn. hort. Cliff. p.* 408); a name to which we may revert without increasing the confusion, since the A. linifolius of subsequent authors is a Galatella, and probably only a variety

of G. hyssopifolia. If this view should prove incorrect, the name of A. subulatus, *Michx.* ought perhaps to be retained for this species rather than the following, to which, however, it is more appropriate. There is no specimen under the name of A. linifolius in the Linnæan herbarium; and the plant which, in the *Species Plantarum*, is cited from Gronovius (the Tripolium flore unico caulem terminante, cujus radii purpurei et longi, &c., *Clayt.*) is A. flexuosus, *Nutt.*

* * * *Scales of the involucre in* 2–3 *series: rays exserted, in a single series.*

123. *A. divaricatus* (Nutt. under Tripolium, *not of* Linn.): annual, very glabrous; stem erect or ascending, diffusely much branched, the branches and branchlets slender; leaves linear-subulate, very acute, with smooth or minutely denticulate-scabrous margins; the lowermost narrowly linear, tapering to the base; those of the branches subulate, very small; heads (small) scattered, loosely paniculate; scales of the turbinate-cylindraceous involucre linear-subulate, very acute, membranaceous, unequal, imbricated in about 3 series; rays numerous in a single series, longer than the disk; achenia scabrous-puberulent.—Tripolium (Astropolium) divaricatum, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 296. T. subulatum, *Nees*, *Ast. p.* 156 (partly); *DC.! prodr.* 5. *p.* 524, partly. Aster subulatus, *Michx.! fl.* 2. *p.* 112, in part.

Salt marshes, South Carolina and Florida! (Key West!) to Louisiana! and swamps in saline prairies of Western Louisiana! Arkansas! and Texas! Also in the West Indies! and probably throughout tropical America, &c. Sept.–Oct.—Stem 6 inches to 3 feet high, often diffusely branched from the base, sometimes slightly scabrous on the angles; the slender branchlets spreading or divaricate. Radical or primordial leaves oval or lanceolate, denticulate, petioled, thickish; the cauline 2–4 inches long, 1-nerved, slender, mostly 1–2 lines wide, tapering to a very sharp point; the upper successively shorter and tapering from the base; those of the branchlets reduced to subulate bracts. Heads one-third to one-half smaller than in the preceding species. Scales of the involucre very narrow, greenish, with broad scarious margins, tapering into very sharp points; the innermost as long as the disk. Rays blue, always longer than the disk, and sometimes exserted nearly the length of the involucre. Disk-flowers equalling or exceeding in number those of the ray. Appendages of the style lanceolate-subulate. Achenia narrowly oblong, obscurely about 4-striate. Receptacle somewhat alveolate. —The A. subulatus of Lessing (Sandwich Islands) has smaller heads, less pointed scales of the involucre, and less exserted rays; it is probably a distinct species.

124. *A. Oreganus* (Nutt. under Tripolium): stem rather tall, flexuous, divaricately branched; cauline leaves rather long, linear-sublanceolate, nearly equal, acute, entire, scabrous on the margin; scales of the involucre linear-lanceolate, imbricate, slightly acute, herbaceous; rays narrow. *Nutt.*—Tripolium Oreganum, *Nutt. in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 296.

On the inundated banks of the Wahlamet.—Flowers [heads] very inconspicuous, somewhat fastigiate. *Nuttall.*—This species has not come under our examination. We are inclined (both from the description and the habitat) to suppose it the same, perhaps, as the Tripolium subulatum *β. Nees* (Aster subulatus, *Less.*), from the Sandwich Islands.

125. *A. exilis* (Ell.): stem strict, slender, glabrous, with a few scattered simple branches, bearing solitary or mostly racemose heads; leaves narrowly linear, elongated, subulate-acute, entire, with the margins minute serrulate-scabrous; those of the branches much shorter; scales of the involucre lanceolate-linear, acute, unequal, imbricated in about 3 series; rays (about

20) exserted; achenia slightly pubescent.—*Ell.! sk.* 2. *p.* 344; *DC. prodr.* 5. *p.* 247.

Damp soils in the western districts of Georgia, *Elliott!* Sept.-Oct.—Root apparently annual. "Stem 4–5 feet high, erect, very slender, with a few scattering branches, which near the summit become corymbose. Lower leaves 4 to 6 inches long, scarcely exceeding a line in width, very slightly scabrous along the margin; the upper diminishing in size; those of the branches linear-lanceolate. Flowers [heads] on the lower branches few, on the upper in racemes, on peduncles 2 to 4 lines long. Florets of the ray narrow, twice as long as the involucrum, pale purple; of the disk yellowish." *Ell.*—We have only seen the specimen in Elliott's herbarium. It is allied to the preceding, but is a much more strict plant; the broader and less pointed scales of the involucre more rigid, &c.

126. *A. pauciflorus* (Nutt.): perennial? stem glabrous below, simple, or racemosely branched above; the strict branches and the somewhat equal (linear-lanceolate) scales of the hemispherical involucre densely viscid-pubescent; leaves subulate-linear, somewhat fleshy; the lowermost linear, 3-nerved, tapering into a slender petiole, glabrous; those of the branches subulate, scattered, somewhat viscid; rays (15–24) rather short; achenia narrow, obscurely striate, nearly glabrous.—*Nutt.! gen.* 2. *p.* 154, & *in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 292. Tripolium subulatum, *Nees, Ast. p.* 167; *Hook.! fl. Bor.-Am.* 2. *p.* 15; *Lindl.! in DC. prodr.* 5. *p.* 254.

Margin of saline springs, near Fort Mandan on the Missouri, *Nuttall!* to the Saskatchawan, &c. *Drummond!* Aug.—Stem 8–20 inches high, rather rigid, scarcely flexuous; the heads (about as large as in A. angustus) solitary or nearly so on the simple or dichotomous branches. Lower leaves 4–6 inches long; the upper a line wide, partly clasping, tapering to a sharp point, the margins scarcely if at all scabrous. Scales of the involucre in about 2 series, acute, with scarious margins, rather shorter than the disk, loose. Rays pale purple, linear-oblong. Pappus capillary, nearly in a single series. Appendages of the style lanceolate-subulate; the stigmatic portion narrowed downwards. Achenia beset with a few very minute scattered hairs. Receptacle slightly alveolate.—This is a somewhat peculiar species, but it is certainly an Oxytripolium (with which it accords in habit,) rather than an Alpigenous Aster.

127? A. *occidentalis* (Nutt. under Tripolium): stem nearly simple, with few large and corymbose heads; leaves all linear subulate, clasping, here and there incisely serrate; involucre loosely imbricate; the scales subulate, subherbaceous, nearly equal; rays as long as the disk (pale blue); achenia nearly smooth, scarcely striate, compressed. *Nutt.*—Tripolium (Astropolium) occidentale, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 296.

"Margins of muddy ponds in the Rocky Mountains, 7000 feet above the level of the sea.—Root creeping, slender: stem slender, four inches to a foot high, often only one or two-flowered, seldom more than five or six. Leaves long and narrow, linear, entire, or with one or two pairs of deep incise serratures, almost approaching to a pinnatifid division: branchlets slender, one-flowered: the flower as large as a daisy, with a simple series of pale blue or pink rays. An alpine species, approaching the true Tripolium in the fruit being almost destitute of striation." *Nutt.*—This is described by Mr. Nuttall as a species of his Tripolium § Astropolium (which corresponds with the Oxytripolia of De Candolle). It seems to us, however, to belong rather with the Alpigenous Asters, except that the appendages of the style are lanceolate-subulate. The upper part of the stem and often the margins of the leaves are a little pubescent; and the rays are much exserted beyond the disk. The linear-oblong achenia are clothed with a minute appressed pubescence. The root is probably perennial.

128? *A. frondosus* (Nutt. under Tripolium): stem much branched; leaves linear, entire, clasping, rather obtuse, heads fastigiate; scales of the involucre, loose and leafy, rather obtuse; rays numerous, very small and slender; achenia nearly smooth, about 4-striate. *Nutt.*—Tripolium (Astropolium) frondosum, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 296.

"Muddy ponds in the Rocky Mountains, near Lewis River of the Shoshonee; rare: growing partly in the water, and mud. Apparently biennial, with very inconspicuous flowers, and an entirely leafy nearly equal involucrum of about 2 series of leaflets." *Nutt.*—Our specimens are very imperfect, and the flowers not fully developed.

129? *A. spinosus* (Benth.): glabrous, much branched; the branches rush-like, furnished with minute scattered scale-like leaves, which are somewhat caducous, often bearing spines in their axils; heads solitary terminating the branches, or somewhat racemose; scales of the involucre imbricated in 2–3 series, unequal, shorter than the disk, lanceolate, with membranaceous margins; rays short; achenia very glabrous.—*Benth.! pl. Hartw.* (*no.* 148.) *p.* 20.

Texas, *Drummond!*—A singular, apparently leafless species; its long branches terminated by rather small heads; the subulate leaves 1 to 2 or 3 lines long; those of the lower part of the stem unknown. Exterior scales of the involucre ovate-lanceolate; the innermost longer, narrowly lanceolate, with broader membranaceous margins. Rays numerous in a single series, nearly twice the length of the pappus; the ligules linear-oblong. Appendages of the style (of the disk-flowers) short and thick, somewhat conical. Pappus nearly equal, in a single series, capillary. Achenia linear-oblong, slightly compressed, obscurely nerved.—The Texan specimens exhibit fewer short spines, or abortive branchlets, than the Mexican, and some are altogether destitute of them; but we find no other difference.

*** **The following species reached us too late for insertion in the sections to which they belong.**

§ 2. CALLIASTRUM, *p.* 106.

130. *A. mirabilis:* pubescent-scabrous; stem simple, sparingly corymbose-paniculate at the summit; leaves ovate, strigose-scabrous above; the lowest (and radical?) abruptly narrowed into a petiole; the others sessile, rather acute; those of the branches small, roundish; involucre hemispherical, shorter than the disk; the scales regularly imbricated in 4–5 unequal series, oblong-linear, with conspicuous squarrose-recurved obtuse herbaceous tips; rays (about 20) elongated; achenia linear, scarcely compressed, nearly glabrous (minutely hairy under a lens when young), striate.

Columbia, South Carolina (probably in dry soil), *Professor Gibbes!* Sept.—Stem 1–2 feet or more in height, apparently simple, clothed with a close and rather rough pubescence, which is scarcely if at all viscid, sparingly branched towards the summit; the branches bearing solitary or 2–3 scattered heads, or sometimes 4 or 5 heads, somewhat crowded at the summit. Leaves thickish when old, rather strongly pinnately veined and more or less reticulated, all serrate from the base to the apex with close and short mucronate teeth; the lower surface less scabrous and more pubescent than the upper, often somewhat hoary; the cauline 1–3 inches long, uniformly ovate, but the upper gradually diminishing in size, all but the lowermost closely sessile, not clasping; those of the branches similar but much smaller, obtuse, and nearly round; the lowest cauline abruptly narrowed into a margined petiole, or rarely almost cordate; the proper radical leaves wanting. Heads nearly as large as in A. spectabilis, subglobose. Involucre minutely pubescent; the scales between chartaceous and coriaceous in texture, whitish,

closely imbricated, with rather short, but conspicuous, squarrose or reflexed herbaceous tips. Rays large, thrice the length of the involucre, blue or violet. Achenia narrow and slender, many-striate, somewhat shorter than the rather rigid (brownish or ferruginous) unequal pappus; the innermost bristles of which are manifestly thickened towards the apex. Appendages of the style subulate-lanceolate, and at length recurved or reflexed, as in Biotia.—This very interesting species furnishes additional evidence of the propriety of re-uniting Biotia with Aster; being exactly intermediate in character and appearance between that group and our subgenus Calliastrum. We have received it only from Professor Gibbes of Charleston, South Carolina, who collected it at Columbia in the year 1835. The Biotia commixta, a plant of unknown origin cultivated in the European gardens, which is said to have a squarrose involucre, has (fide descr. *Nees*,) oblong-lanceolate and partly clasping upper leaves, a very compound corymb, glutinous pubescence, and an involucre resembling Aster macrophyllus, as long as the disk; the scales oblong-lanceolate, acute, &c. &c.—This species should be placed at the commencement of the section Calliastrum, before A. Radula.

§ 3. ASTER proper, *Subdiv.* Concinni, *p.* 115.

131. *A. gracilentus:* very smooth and glabrous throughout; stem slender, strict, simple, loosely paniculate or somewhat corymbose at the summit; cauline leaves linear, elongated, with very scabrous margins, slightly clasping, acute or acuminate; the lower coarsely toothed or incised above the middle, the upper entire; those of the branches and branchlets very small and numerous, erect, linear-subulate; scales of the obovoid involucre (much shorter than the disk) closely imbricated in 3 or 4 series, appressed, lanceolate, acute; the exterior very short; achenia glabrous.

Lincolnton, North Carolina, *Mr. M. A. Curtis!*—Stem rigid, purple, 2–3 feet high, branching only at the summit; the branches and branchlets slender, spreading, terminated by solitary heads, which are smaller than in most states of A. lævis. Lower (cauline) leaves 5–6 inches long, about 3 lines wide, 1-nerved, obscurely reticulate-veined, somewhat shining above, pale beneath, rather rigid, furnished towards the apex on each side with 3 or 4 very coarse and spreading irregular teeth, or appearing somewhat pinnately incised: upper cauline similar, but successively shorter, and entire. Involucre very short; the green tips small and inconspicuous; the exterior lanceolate-subulate; the inner larger, lanceolate-linear, less acute, often tinged with purple. Rays about twice the length of the disk, blue or violet. Ovaries minutely pubescent, but the achenia perfectly smooth and glabrous, similar to those of A. lævis, &c.—We have described this species from a single specimen, which is however so remarkable that it is scarcely liable to be confounded with any other.

27. ERIGERON. *Linn.* (excl. spec.); *Nutt. gen.* 2. *p.* 146.

Erigeron, Stenactis, & Phalacroloma, *DC.*; and also Polyactidium? & Heterochæta?

Heads mostly hemispherical, many flowered; the ray-flowers very numerous and usually in more than one series, pistillate; those of the disk tubular, perfect; or some of the exterior (rather transformed ray-flowers) filiform-tubular and truncate, pistillate. Scales of the involucre mostly equal, narrow, in a single or somewhat double series. Receptacle flat, naked, punctate or scrobiculate. Appendages of the style very short and obtuse. Achenia compressed, usually pubescent, commonly with 2 lateral nerves. Pappus a single series of capillary scabrous bristles, rather few (12–30) in number,

often with minute setæ intermixed or forming an indistinct outer series, or sometimes with a distinct and short, squamellate-subulate or setaceous (or somewhat coroniform) exterior pappus; the inner rarely wanting in the ray. —Herbs, or rarely suffrutescent plants; with entire, toothed, or lobed leaves. Heads solitary, corymbose, or paniculate. Rays white, blue, or purple.

It appears to us impossible to effect generic divisions among these plants, by characters derived from the single or double series of rays, or from the simple or double pappus, or by any combination of these. The characters of our sections, or subgenera, exhibit the diversities which the North American species present in these respects. As a whole, the genus is distinguished from Diplopappus by the very short and obtuse appendages of the style, the nearly simple involucre, and the naked receptacle: the same characters also distinguish it from Aster; but the Alpigenous Asters almost connect the two genera.

§ 1. *Rays in several series, shorter than the involucre: pappus simple: achenia 2-nerved: corolla of the disk mostly 4-toothed: annual or biennial herbs: heads very small, cylindrical.*—CÆNOTUS, Nutt.

1. *E. Canadense* (Linn.): stem erect, hispid, or sometimes nearly glabrous, paniculately very much branched above; leaves lanceolate-linear, mostly entire, hispidly ciliate; heads small, very numerous, corymbose-paniculate or somewhat racemosely disposed on the branchlets; rays (white) scarcely longer than the pappus; achenia oblong, sparsely hispid.—*Linn.! spec.* 2. *p.* 863; *Fl. Dan. t.* 292; *Michx.! fl.* 2. *p.* 123; *Nutt.! gen.* 2. *p.* 148; *Hook.! fl. Bor.-Am.* 2. *p.* 20; *Darlingt.! fl. Cest. p.* 471; *DC.! prodr.* 5. *p.* 289. E. pusillum, *Nutt.! l. c.* (a depauperate form.) Senecio ciliatus, *Walt.*

Fields and waste or open places, Canada! and Saskatchawan! throughout the United States! to Texas! and in Oregon! Also apparently indigenous to almost every part of the world, and naturalized in Europe. July–Oct.—A common weed, very variable in size (from 5 inches to 5 feet) and mode of growth. Involucre at first cylindrical, at length spreading. Ligule of the ray many times shorter than the tube. Corolla of the disk (perhaps always?) 4-toothed. Radical leaves often pinnately incised or lobed.—*Horse-weed. Butter-weed.*

2. *E. divaricatum* (Michx.): decumbent, diffuse, and very much branched, the branchlets fastigiate, strigose-hirsute and often somewhat hispid; leaves linear or subulate; heads small, loosely paniculate-corymbose; rays (purple) not longer than the pappus; achenia oblong, almost glabrous.—*Michx.! fl.* 2. *p.* 123; *Pursh! fl.* 2. *p.* 534; *Nutt. l. c.*; *DC. l. c.*

Throughout the Western States, from Illinois! and Upper Missouri! to Louisiana! along the Mississippi; in similar situations with the preceding, flowering during the whole summer.—Plant rarely exceeding 6 inches in height, but very diffuse, at length spreading out one or two feet in width.

§ 2. *Rays crowded or in two or more series, longer than the involucre: pappus simple or sometimes with minute setæ intermixed or forming an indistinct external series: achenia 2-nerved: mostly perennial.*—EUERIGERON. (Euerigeron & Trimorphæa, *DC.* excl. spec.)

* *Cæspitose acaulescent (chiefly alpine) species: scapes bearing a single head: leaves mostly 3-cleft or divided: pistillate flowers all ligulate.*

3. *E. compositum* (Pursh): canescently hirsute; leaves on long petioles, 1–3-ternately divided or parted; the ultimate segments linear, obtuse; scapes

naked or with a few linear bracts; rays twice the length of the involucre; achenia hirsute; pappus hispid-scabrous, as long as the corolla of the disk.—*Pursh! fl.* 2. *p.* 535; *Hook.! fl. Bor.-Am.* 2. *p.* 17 (vars. *β.* & *γ.*); *Nutt.! in jour. acad. Philad.* 7. *p.* 32, & *in trans. Amer. phil. soc. l. c.*; *DC. prodr.* 5. *p.* 288. Cineraria Lewisii, *Richards.! appx. Frankl. jour. ed.* 2. *p.* 32.

β. smaller; leaves 3-parted; the segments very short, 3-lobed.—E. compositum, *Hook. in Linn. trans.* 14. *p.* 374, *t.* 13.

Interior of Oregon, on the banks of the Kooskoosky! Flat Head River! &c., and on the Rocky Mountains! Also east of the mountains between lat. 64°, and the Arctic Sea, *Richardson!* *β.* Arctic coast and islands! June–July.—Scapes 2–6 inches high, often leafy near the base. Head large; the rays white or pale pink. Bristles of the pappus about 15, with a few minute interposed setæ.

4. *E. trifidum* (Hook.): hirsute; leaves on long petioles, 3-cleft; the segments short, entire, or the lateral often 2-lobed; scapes nearly naked; rays twice the length of the very hirsute involucre; achenia minutely hairy; pappus hispid-scabrous, as long as the corolla of the disk.—*Hook.! fl. Bor.-Am.* 2. *p.* 17, *t.* 120.

Rocky Mountains, *Drummond!*—Resembles the preceding; the heads about the same size. Leaves slightly fleshy.

5. *E. pedatum* (Nutt.): somewhat glabrous; leaves on slender sparsely ciliate-hispid petioles, 3-parted; the segments linear, obtuse, entire, or the lateral 2-lobed or toothed; scapes naked; rays longer than the scarcely hirsute involucre; achenia minutely hirsute; pappus hispid-scabrous.—*Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 308.

Oregon, on the gravel bars of small streams to the east of Walla-wallah, *Nuttall!*—Resembles E. trifidum; but the leaves are glabrous, except the strongly ciliate petioles, and the lobes more slender; the heads are scarcely half the size, and the involucre somewhat glabrous. Scapes glabrous, 2–3 inches high. Rays 'pale rose-color,' nearly in a single series.

6. *E. radicatum* (Hook.): minutely hirsute and somewhat canescent; leaves linear-spatulate, entire, rather thick or fleshy; scapes with one or two small leaves; rays not twice the length of the tomentose or hirsute involucre; achenia minutely hairy; bristles of the pappus few, scabrous, shorter than the corolla.—*Hook.! fl. Bor.-Am.* 2. *p.* 17, *t.* 122; *Nutt.! in trans. Amer. phil. soc. l. c.*

Near Jasper's Lake in the Rocky Mountains, *Drummond!* and in the Blue Mountains of Oregon, *Nuttall!*—Leaves nearly sessile, glabrous when old, less than an inch long, clustered. Scapes 2 or 3 inches high. Heads smaller than in E. uniflorum; the rays spreading, white.

8. *E. nanum* (Nutt.): canescently hirsute; leaves narrowly linear, and slightly spatulate, scarcely obtuse; scapes naked above; rays scarcely twice the length of the hirsute-pubescent involucre; achenia minutely hairy; pappus about the length of the corolla, hispid-scabrous.—*Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 308.

Rocky Mountains, in about lat. 42°, *Nuttall!*—Leaves in a dense cluster, 1–2 inches long, scarcely half a line wide, somewhat petioled. Scapes 2–4 inches long, tomentose-pubescent.—"Resembles the preceding; but has hirsute leaves, and a different achenium and pappus." *Nutt.*

8. *E. lanatum* (Hook.): very woolly; leaves spatulate, petioled, entire, the lowermost often 3-lobed or toothed at the apex; scapes mostly leafless; the upper portion and the involucre extremely woolly; rays elongated; achenia glabrous; pappus hispid-scabrous, as long as the corolla of the disk.—*Hook.! fl. Bor.-Am.* 2. *p.* 17, *t.* 121; *DC. prodr.* 7. (*mant.*) *p.* 275.

Summits of the Rocky Mountains, between lat. 52° and 56°, *Drummond!* —Scapes about 3 inches high. Head much larger than in E. uniflorum; the rays white or rarely tinged with purple.

* * *Somewhat cæspitose (subalpine) species: stems mostly short, leafy, bearing one or few heads: leaves entire: the inner series of pistillate flowers often filiform-tubular, truncate.* (Trimorphæa, *Cass.*)

9. *E. uniflorum* (Linn.): stem short, bearing a single head; leaves hirsute; the cauline lanceolate or linear; the radical ones spatulate and becoming somewhat glabrous; pistillate flowers nearly all ligulate; the rays somewhat erect, scarcely twice the length of the very woolly involucre.—*Linn.! spec.* 2. *p.* 864, & *fl. Lapp. t.* 9, *f.* 3; *Hook.! fl. Bor.-Am.* 2. *p.* 17. E. alpinum, *Pursh, fl.* 2. *p.* 532. E. alpinum γ. *DC.! prodr.* 5. *p.* 290. E. pulchellum β. Unalaschkense, *DC. l. c. p.* 287. E. humile, *Graham, in Edinb. phil. jour.* 1828. *p.* 175 *?*

Arctic shore and islands from Greenland to Behring's Straits and Unalaschka! Summits of the Rocky Mountains, *Drummond!* Labrador!—The involucre and its dense woolly covering are usually purple in the American specimens, as they frequently are in the European. There are minute slightly squamellate setæ mixed with the longer bristles of the pappus, which are sometimes so copious as to form an indistinct outer series, in this species. and also in E. alpinum and E. grandiflorum.

10. *E. grandiflorum* (Hook.): very hirsute; caudex thick; stems short, bearing a single head; radical leaves oblong-spatulate; the cauline oval-lanceolate; pistillate flowers all ligulate; the rays spreading, twice the length of the very densely woolly involucre.—*Hook.! fl. Bor.-Am.* 2. *p.* 18, *t.* 123.

Summits of the Rocky Mountains, *Drummond!*—Stems 4–6 inches high. Heads very large for the size of the plant. Scales of the involucre with purplish and naked tips; the woolly covering white. Rays white or purple.—Can this also be the E. grandiflorum of Hoppe?

11. *E. alpinum* (Linn.): somewhat hirsute; stem somewhat elongated, bearing one or few heads; leaves lanceolate; the radical ones spatulate, tapering into a petiole; the inner pistillate flowers numerous, tubular-filiform, truncate; the rays spreading, twice the length of the hirsute involucre; pappus of the disk as long as the corolla.—*Linn.! spec.* 2. *p.* 864; *Engl. bot. t.* 464; *Hook.! fl. Bor.-Am.* 2. *p.* 18; *DC.! prodr.* 5. *p.* 291. (*a.*)

β. leaves narrower; branches elongated. *Hook.! l. c.*

γ. tall (about a foot high); heads several. *Hook.! l. c.*

Rocky Mountains, *Drummond!*—Rays purple. Apparently a very rare species in this country.—The exterior pappus, if it may so be called, in this species was observed by Cassini (*Dict. sci. nat.* 37, *p.* 485), who therefore referred it to his genus Stenactis.

12. *E. glabratum* (Hoppe): almost glabrous; stem tall, simple; radical leaves spatulate; the cauline linear-lanceolate; raceme terminal, many-flowered; peduncles elongated, scarcely corymbose, simple or branched; scales of the small involucre very narrow [pistillate flowers mostly or wholly ligulate]; rays inconspicuous, immersed in the copious pappus. *Hook.*—"*Hoppe & Hornsch. cent.; Bl. & Fing. comp. fl. Germ.* 2. *p.* 364"; *Koch, fl. Germ. & Helv. p.* 354; *Hook.! fl. Bor.-Am.* 2. *p.* 18. E. alpinum β. ramosum, *Wahl. fl. Lapp. p.* 207. E. alpinum β. *DC. l. c.* E. racemosum, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 312.

β. peduncles contracted.—E. racemosum β. angustifolium, *Nutt.! l. c.*

Hudson's Bay to the Rocky Mountains, and from Saskatchawan to Fort

Franklin on the Mackenzie River, *Richardson! Drummond!* Rocky Mountains in about lat. 42°, *Nuttall!*—Plant from 4–6 inches to 2 feet high.—Our specimens from the north of Europe very well accord with the American plant.

13. *E. nivale* (Nutt.): stems somewhat cæspitose and hairy at the base, mostly bearing single heads; radical leaves spatulate; the cauline lanceolate, acuminate, somewhat clasping; involucre and the summit of the stem glandularly pubescent; the scales linear and acuminate (not hirsute); pappus longer than the linear elongated somewhat pubescent achenium. *Nutt. in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 311.

Central chain of the Rocky Mountains, lat. 42°, towards the sources of the Colorado of the West; near the limits of perpetual snow, *Nuttall.*—"Allied to A. alpinus, but with subamplexicaul leaves, widest at the base. Pappus longer than the involucre. Rays? A few filiform pistillate florets outside the discal ones. Achenium long and linear, compressed, slightly silky." *Nutt.*—We have not examined this species, which is founded, we believe, on a single specimen. We see not how it is to be clearly distinguished from some states of Hooker's E. alpinum, in which the upper cauline leaves are often broadest at the base.

* * * *Stem leafy at the base, elongated and scape-like above, bearing a single head: pistillate flowers all ligulate.*

14. *E. scaposum* (DC.): stem decumbent and leafy at the base, naked and much elongated above, pubescent; leaves hirsute with appressed hairs, lanceolate-oblong or spatulate, coarsely toothed; the radical ones crowded, somewhat petioled; those of the sterile branches or lower part of the flowering stems lanceolate, partly clasping; rays very numerous, about twice the length of the canescently hirsute involucre; achenia hirsute.—*DC. prodr.* 5. *p.* 287; *Benth.! pl. Hartw. p.* 17. Aster rivularis, *Less. in Linnæa*, 5. *p.* 142.

Rio Brazos, Texas, *Drummond!* Also Texas, *Mr. Callana!*—Scape or naked summit of the stem 4–7 inches long. Rays apparently white.—The Texan plant accords with that of Hartweg from the north of Mexico; and also with a specimen from Jalapa, received from Prof. Schlechtendal, under the name of Aster rivularis, *Less.*

* * * * *Stem leafy: heads mostly corymbose or panicled: pistillate flowers all ligulate.*

15. *E. Bellidiastrum* (Nutt.): annual; stem leafy throughout, somewhat corymbosely branched, hirsute-pubescent; leaves entire, oblong-linear or linear-spatulate, obtuse, tapering to the base, the lower petioled; heads solitary terminating the branches, pedunculate; rays (pale red) nearly twice the length of the involucre, scarcely in a double series; achenia minutely pubescent.—*Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 307.

Borders of the Platte, within the Rocky Mountains, *Nuttall!*—Stem about a foot high. Leaves more or less pubescent, 1–2 inches long, 2–4 lines wide, tapering into a slender narrowed base, or the lowermost with attenuate petioles, thickish, more or less pubescent. Heads few, small. Scales of the involucre somewhat strigose-canescent. Pappus simple, of 15–20 very slender deciduous bristles, rather shorter than the corolla.

16. *E. bellidifolium* (Muhl.): stoloniferous at the base, hirsute, especially when young, with soft spreading hairs; radical leaves obovate or broadly spatulate, somewhat serrate or entire; the cauline (often few and distant) oblong or lanceolate-oblong, partly clasping, mostly entire; heads few (1–5, rarely 7–9) and large, corymbose; the lateral pedicels elongated; rays (about 50) rather broadly linear, scarcely in a double series, twice the length of the involucre, light bluish-purple; achenia glabrous.—*Muhl.! in Willd. spec.* 3.

p. 1958; *Bot. mag. t.* 2402; *Pursh! fl.* 2. *p.* 502; *Ell. sk.* 2. *p.* 393; *DC.! prodr.* 5. *p.* 285. E. pulchellum, *Michx.! fl.* 2. *p.* 124 (excl. syn. *Gronov.* which relates to Marshallia!); *Darlingt. fl. Cest. p.* 472; not of *DC.*, nor of *Hook.?*

Borders of woods and thickets, Canada! (and in the wooded country from lat. 54°–64°, fide *Richardson*) to Louisiana! May–June, or in the Southern States, March–April.—Stem simple, 9–20 inches high. Radical leaves clustered, 2–3 inches long, and 1–2 wide, very obtuse. Cauline leaves often very few, but sometimes numerous. Pedicels thickened or obconical at the summit. Pappus simple.—Varies cousiderably in the degree of the pubescence, the more or less entire or toothed leaves; but perfectly distinguished from E. Philadelphicum (with which it has sometimes been confounded) by the larger heads, bluish-purple (not reddish-purple) much broader rays, glabrous achenia, and by the stolons, &c. It is the earliest-flowering species in the Northern States.—The plant we have under the name of E. pulchellus, *Hook. fl. Bor.-Am.*, is the same with the E. glabellus *β.* of the same work, whence (although it may have been so labelled by mistake) we have not cited the synonym here, particularly as the character does not well accord with our E. bellidifolium. Hooker also mentions a variety from Oregon, with the leaves deeply toothed, which is probably what we consider a variety of E. Philadelphicum.

17. *E. Philadelphicum* (Linn.): hirsute or hairy; stem slender, loosely corymbose above; leaves membranaceous, with a conspicuous midrib, ciliate; the radical and lowermost spatulate-oblong, tapering into a slender base or margined petiole, obtusely serrate or nearly entire; the upper cauline oblong, clasping and mostly cordate at the base, entire, or rarely somewhat serrate; heads corymbose (rather small); rays innumerable, very narrow, pale reddish-purple or flesh-color, more than twice the length of the involucre; achenia minutely hairy.—*Linn.! spec.* 2. *p.* 863; *Willd.! spec.* 3. *p.* 1957; *Michx.! fl.* 2. *p.* 123; *Pursh! fl.* 2. *p.* 533; *Darlingt.! fl. Cest. p.* 462; *Hook. compan. to bot. mag.* 1. *p.* 96; not of *Ell.* or *DC.*, nor of *Bart.* E. purpureum, *Ait. Kew.* (*ed.* 1.) 3. *p.* 186; *Pursh! l. c.*; *Hook.! fl. Bor.-Am.* 2. *p.* 19; *DC.! prodr.* 5. *p.* 286. E. amplexicaule, *Torr.! in Short, cat. Kentucky plants.*

β. stem stout; cauline leaves larger, mostly coarsely and sharply serrate; corymbs compound; rays pale or nearly white.

γ.? stem tall and stout, glabrous above, as also the numerous sharply serrate leaves; corymbs compound.

δ. "stem elongated and slender towards the summit, very hairy at the base; radical leaves spatulate-lanceolate, dentate; flowers white; the rays not much longer than the disk." *Nutt.*—E. purpureum *β.* attenuatum, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 307.

Woodlands and fields, common nearly throughout North America, from Hudson's Bay and the Arctic Circle (*Richardson*) Saskatchawan! &c. to Louisiana! and west to Oregon! and California! *γ.* Oregon, *Dr. Scouler! Drummond!* *δ.* Oregon and Arkansas, *Nuttall!* June–Aug; the varieties *β.* & *γ.* commencing in April or May in the Southern States.—Stem 1–2, in *β.* & *γ.* often more than 3 feet high, villous-hirsute towards the base. Leaves bright green, thin; the broad and whitish midrib conspicuous underneath. Pedicels naked, thickened at the summit. Scales of the involucre somewhat hairy on the back; the margins scarious. Pappus simple.—Variable as to size &c., but a well-marked species. The var. *δ.* appears to be an attenuated state of *β.*, and like it has very pale rays, and probably grows in shade.—We know not why Linnæus applied to this species the name of E. Philadelphicum, since his specimen, communicated by Kalm, is said to come from Canada.

18. *E. quercifolium* (Lam.): pubescent; stem loosely corymbose above; radical leaves obovate-oblong, mostly lyrate-pinnatifid or deeply sinuate-toothed; the cauline scattered, oblong-lanceolate, partly clasping, sharply toothed, or the uppermost entire; heads small and numerous; rays innumerable, almost capillary, twice the length of the involucre, pale purple; achenia minutely hairy.—*Lam. ill. t.* 681, *f.* 4; *Poir. dict.* 7. *p.* 491; *Pursh! fl.* 2. *p.* 533; not of *DC.* E. Philadelphicum? *Ell.! sk.* 2. *p.* 396; *DC.! prodr.* 5. *p.* 285; not of *Linn.*, *Willd.!* &c. E. Philadelphicum, *Reichenb. ic. exot. t.* 134?

Fields &c., Florida (*Lamarck*, *Nuttall!*) to Georgia! S. Carolina! and west to Louisiana! and Mississippi! March–June.—Stem 1–2 feet high, furrowed. Heads rather smaller than in E. Philadelphicum; the involucre, and the (often very pale) rays resembling that species. Pappus simple.—This is without doubt the E. quercifolium of Lamarck; and is probably distinct from the preceding, to which some states nearly approach. The form with sparingly toothed leaves is the E. Philadelphicum *a.* of De Candolle; and that with lobed leaves is his var. quercinum.

§ 3. *Rays in a double or single series, much longer than the involucre: pappus double (both in the disk and ray); the exterior short, more or less distinct, setaceous or squamellate-subulate: achenia 2–5-nerved: perennial.* —STENACTIS, Cass, Nees, (*excl. spec.*) (Heterochæta, *DC.?* Erigeron § Phænactis, &c., *Nutt.*)

* *Exterior pappus somewhat indistinct, of short setæ, more or less intermixed with the inner: rays in a double series.*

19. *E. glaucum* (Ker): stems several from a persistent caudex or rhizoma, ascending, more or less villous with soft slightly viscid hairs, simple or sparingly branched, terminated by large solitary heads; leaves spatulate-oblong, obtuse, sessile, the upper often hairy; the lowest spatulate-obovate, somewhat 3-nerved, tapering into a margined petiole: rays very numerous (about 100), twice the length of the pubescent or villous involucre; achenia sparsely hairy, 4-nerved.—*Ker, bot. reg. t.* 10; *DC. prodr.* 5. *p.* 284. (Aster Bonariensis, *Spreng. syst.* 3. *p.* 528.) Stenactis glauca, *Nees, Ast. p.* 275. Aster Californicus, *Less. in Linnæa*, 6. *p.* 121; *Hook. & Arn.! bot. Beechey, p.* 146; *Nees, Ast. p.* 53; *DC. prodr.* 5. *p.* 228.

β. plant more villous throughout.—E. maritimum, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 310. Woodvillea calendulacea, *DC. prodr.* 5. *p.* 318?

Coast of California and Oregon, *Menzies! Capt. Beechey! Douglas? Nuttall!* (*β.*)—Stem or caudex decumbent, sending up mostly simple branches in the wild state, 3–12 inches high, terminated by solitary heads as large as the Marigold (1 to nearly 2 inches in diameter including the pale red rays), more or less pubescent or villous, as well as the involucre, with soft spreading hairs, which are somewhat viscid towards the summit of the stem. Leaves rather succulent; the margins of the upper ones often villous-ciliate, and the surfaces of the uppermost also villous in var. *β.*—The more hairy variety of this plant (the rays of which appear yellowish in dried specimens) is without much doubt the Woodvillea calendulacea of De Candolle: no other plant of Douglas's collection accords with the description. We have also adopted the suggestion of Hooker & Arnott (*Bot. Beechey, suppl. p.* 351), as to the identity of the Aster Californicus, *Less*, (a less villous form of the same species), with Erigeron glaucum, *Ker*, of unknown origin, supposed to come from South America; but which these authors, apparently with good reason, suspect to have been raised from seeds

brought from California or Oregon by Mr. Menzies; whose dried specimens, we may remark, almost entirely agree with the cultivated E. glaucum.

20. *E. macranthum* (Nutt.): nearly glabrous; stem leafy to the summit; leaves glabrous, with hispidly ciliate margins, obtuse, mucronulate; the upper oblong-ovate or elliptical, partly clasping; the lowermost oblong-spatulate, tapering into a petiole; heads few (3–5) on simple naked peduncles; rays numerous, twice the length of the glabrous and slightly glandular involucre; achenia slightly hairy, 2-nerved.—*Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 310.

β. leaves very acute; heads larger.—E. grandiflorum, *Nutt.! in jour. acad. Philad.* 7. *p.* 31, not of *Hook.*

Sources of the Missouri, and plains of the Platte, near the Rocky Mountains, *Mr. Wyeth! Nuttall!* Aug.—Leaves thickish, reticulated; the upper about an inch long and half an inch wide. Heads smaller than in E. speciosum; the rays blue, fewer in number. Involucre glabrous to the naked eye, minutely glandular under a lens.—The variety with acute leaves approaches E. speciosum, from which, indeed, it appears to be distinguished chiefly by its glabrous involucre.

21. *E. speciosum* (DC.): stem glabrous below, much branched and sparsely hispid above, leafy to the summit; leaves lanceolate, mostly acute or acuminate, entire, hispidly ciliate, closely sessile or somewhat clasping; the radical ones spatulate and tapering into a petiole; heads corymbose, terminating the leafy branchlets; rays very numerous (about 120), nearly thrice the length of the very narrow hispid setigerous-mucronate scales of the involucre; achenia minutely hairy, 2–4-nerved.—*DC.! prodr.* 5. *p.* 284, & 7. (*mant.*) *p.* 274. Stenactis speciosa, *Lindl.! bot. reg. t.* 1577; *Hook. bot. mag. t.* 3607.

β. stem often simple, bearing few heads; leaves narrowly lanceolate, cuspidate-acuminate.—E. speciosum, *Nutt.! in trans. Amer. phil. soc. l. c.*, chiefly. E. glabellum *γ.* mucronulatum, *Hook.! fl. Bor.-Am.* 2. *p.* 19.

California and Oregon, *Douglas!* *β.* Plains of the Oregon, common, *Dr. Scouler! Douglas! Nuttall!*—Stem tall and stout, furrowed. Leaves often nearly glabrous, except the margins, 2–4 inches long. Heads (including the showy violet-purple ray) nearly 2 inches in diameter. Scales of the involucre attenuate, hispid with spreading whitish hairs. Achenia 2–3-(sometimes 4-) nerved. Pappus with short setæ intermixed at the base, forming an indistinct exterior series.

22. *E. glabellum* (Nutt.): stem simple, or sparingly branched and somewhat naked above, pubescent or nearly hispid towards the summit; leaves mostly glabrous, with ciliate and scabrous margins, entire; the upper cauline (small) lanceolate or oblong-lanceolate, acute or mucronate-acuminate, closely sessile or partly clasping; the lower and radical ones spatulate, with a long tapering base or margined petiole; heads 3–7, corymbose; the peduncles naked, thickened at the summit; rays very numerous (more than 100), twice the length of the narrowly linear acute canescently hispid scales of the involucre; achenia sparsely hispid, nearly glabrous when mature, 2–3-nerved.—*Nutt.! gen.* 2. *p.* 147, & *in jour. acad. Philad.* 7. *p.* 147; *Richards. appx. Frankl. journ. ed.* 2. *p.* 30; *Hook.! bot. mag. t.* 2923, & *fl. Bor.-Am.* 2. *p.* 19; *DC.! l. c.* (Varies, 1. with the radical leaves lanceolate, sometimes toothed; the cauline linear; head often solitary: 2. stem stout; leaves larger; heads larger, 7–10, in a simple or slightly compound corymb.)

β. asperum: stem and leaves rough with a strigose-hirsute pubescence (rays nearly white!).—E. asperum, *Nutt.! gen.* 2. *p.* 147; *DC. prodr.* 5. *p.* 286. (E. pulchellus, *α. Hook. fl. Bor.-Am.* 2. *p.* 19 (excl. syn.), fide *herb. Greene, & herb. Torr.*)

γ. *pubescens* (Hook.! l. c.): stem and leaves hirsute throughout with a spreading pubescence.

Prairies and open plains, Missouri, *Nuttall! Mr. Nicollet!* &c. St. Croix River, *Dr. Houghton!* Saskatchawan, *Drummond!* and throughout the woody country to lat. 64°, *Richardson!* Also in Oregon near the Rocky Mountains, *Nuttall!* &c. and on Lewis River, *Mr. Tolmie!* β. Missouri, *Nuttall!* to Arctic America, *Richardson!* γ. Prairies in the Rocky Mountains (lat. 52°), *Drummond!* July–Aug.—Stems 10 inches to 2 feet high, often several from the same root; the lower portion, as well as the radical leaves often entirely glabrous: the upper cauline leaves usually small and scattered, lanceolate or nearly linear, pointed. Heads about as large as in E. bellidifolium, or sometimes nearly equalling those of E. speciosum, to which this species is evidently allied. Rays pale purple or blue, sometimes nearly white.—The pubescence is exceedingly variable, and we have a full series of specimens, connecting the most hairy forms with the nearly smooth and glabrous plant.

* * *Exterior pappus of manifest, subulate or squamellate setæ: rays nearly in a single series.*

23. *E. pumilum* (Nutt.): very hirsute throughout with spreading rigid hairs; stems numerous from the same root, or cæspitose, simple or sparingly branched, terminated by solitary heads; leaves entire, lanceolate or linear, tapering to the base; the radical and lowermost linear-spatulate, tapering into a petiole; rays somewhat in a double series, twice the length of the very hirsute involucre; achenia sparsely hairy; exterior pappus setaceous-subulate, very short.—*Nutt.! gen.* 2. *p.* 147, *& in trans. Amer. phil. soc. l. c.; DC. prodr.* 5. *p.* 286. E. hirsutum, *Pursh! fl.* 2. *p.* 742, not of *Lour.*

Upper Missouri, *Bradbury! Nuttall! Mr. Nicollet!* and plains of the Platte near the Rocky Mountains, *Nuttall!* May–June.—Stems 6–10 inches high, rather stout, clothed like the leaves with almost hispid hairs, simple or forked, or rarely divided into 3 or 4 branches, naked at the summit, bearing single heads nearly as large as those of E. alpinum. Leaves rather rigid; the lowest 2–3 inches long, including the margined petiole, 2–3 lines wide near the apex. Rays white. Bristles of the inner pappus 15–20, scabrous, slightly shorter than the corolla; the exterior rather fewer, very short, but forming a distinct outer series.—In Nuttall's Genera, the pappus is said to be "double, the internal short, about 12-rayed": in Mr. Nuttall's recent memoir it is said to be single, of about 20 rays. The exterior pappus is abundantly manifest in all the specimens we have examined.

24. *E. concinnum:* very hirsute throughout with long spreading hairs; stems several from the same root or caudex, slender, leafy, branching above; the branches or peduncles terminated by single heads; leaves narrowly linear, elongated, entire, attenuate at the base, the lowermost tapering into a petiole; rays narrowly linear, numerous (about 50), in a single series, twice the length of the very hirsute involucre; achenia (immature) hirsute; exterior pappus setose-squamellate.—Distasis? concinna, *Hook. & Arn.! bot. Beechey, suppl. p.* 350.

"Snake River, below the Salmon Falls in the Snake Country" (interior of Oregon), *Mr. Tolmie!*—Stems about a span high; the plant hoary or canescent with the hirsute pubescence, resembling the preceding species, but much more slender throughout. Heads about the size of a Daisy; the rays in the dried specimens bright blue. Inner pappus of 8–10, or more commonly 12–15, hispid-scabrous bristles, nearly the length of the corolla: the exterior fewer, somewhat chaff-like, squamellate-subulate (as in Chrysopsis), forming a distinct outer pappus, rather shorter than the ovary. Receptacle areolate. Appendages of the style, as in all the genus, very short and obtuse.

§ 4. *Rays very numerous, nearly or quite in a single series, longer than the involucre: pappus manifestly double; the exterior very short, subulate or squamellate, or almost coroniform; the interior of few somewhat deciduous bristles, often caducous or wanting in the ray: achenia 2-nerved: annual or biennial.*—PHALACROLOMA, Cass. (Stenactis, *DC.* partly, excl. char.*)

* *Pappus of the ray and disk similar.* (Erigeron § Oligotrichium, *Nutt.*)

25. *E. tenue:* branched from the base, minutely strigose or scabrous; stems slender, ascending or erect, bearing few (1–9) small heads on slender peduncles; leaves short, with minutely ciliate and scabrous margins; the radical ones spatulate-oblong, somewhat lyrately toothed or sparingly lobed, on slender petioles; the lower cauline mostly oblong-linear, entire; rays very narrow and numerous, twice the length of the almost glabrous involucre; inner pappus of 12–20 rather fragile bristles.—E. quercifolium, (*Nutt.!*) *DC.! prodr.* 5. *p.* 285, certainly not of *Lam.*

Prairies, and banks of rivers, Arkansas, *Nuttall!* Louisiana, *Dr. Carpenter! Dr. Hale! Dr. Leavenworth!* Texas, *Drummond!* April–June.—Ⓐ or 2 ? Stems slender, 5–10 inches high, pubescent near the base. Leaves somewhat glabrous, the lower about an inch long. Heads smaller than in E. quercifolium, when several in number somewhat corymbose; the peduncles slightly thickened at the summit. Rays purplish, very slender, more than 100 in number, but nearly or quite in a single series. Inner pappus similar in the disk and ray, of 12 to 20 slender rather fragile scabrous bristles; the exterior very manifest, setaceous-squamellate, much shorter than the slightly pubescent achenia.

26. *E. divergens:* somewhat hoary with a minute hirsute pubescence, diffusely branched from the base; leaves small, entire, acute; the radical somewhat spatulate, narrowed into a short petiole; the cauline scattered, sessile, linear, narrowed at the base; heads (small) mostly solitary terminating the naked branchlets or peduncles; rays very narrow and numerous, twice the length of the hirsute involucre; inner pappus of few (8–12) very slender and deciduous bristles.—Erigeron (Oligotrichium) divaricatum, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 311, not of *Michx.*

Rocky Mountains, and plains of the interior of Oregon, *Nuttall!*—Ⓘ Stems about a foot high, diffuse, ascending, slender, at length much branched. Leaves half an inch to an inch long, 1 to 2 lines wide, mucronate-acute. Heads rather smaller than in E. tenue; the rays (white, *Nutt.*) nearly similar; the exterior pappus shorter.

* * *Inner pappus of the ray almost or entirely wanting.* (Phalacroloma, *Cass.*, proper.)

27. *E. annuum* (Pers.): sparsely hirsute or hispid with more or less spreading hairs; stem corymbosely branched above; leaves coarsely and sharply serrate-toothed; the radical and lowermost ovate, obtuse, tapering into a margined petiole; the others ovate-lanceolate, sessile, acute and entire at each end; the uppermost lanceolate, mostly entire; rays very narrow, not twice the length of the sparsely setose-hispid involucre.—*Pers. syn.* 2. *p.* 431; *Hook. fl. Bor.-Am.* 2. *p.* 20. E. heterophyllum, *Muhl.! in Willd. spec.* 3. *p.* 1956; *Pers. l. c.*; *Pursh! fl.* 2. *p.* 534; *Nutt.! gen.* 2. *p.* 148; *Bart. veg. mat. med. t.* 21; *Darlingt.! fl. Cest. p.* 472. E. strigosum,

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* None of the North American species of De Candolle's Stenactis accord with his generic character, in which the simple pappus of the ray is said to be similar to the *inner* pappus of the disk; and it is equally at variance with the character given by Nees. The two Asiatic species belong to Stenactis, of Nees.

Bigel. fl. Bost. ed. 2. *p.* 302. Aster annuus, *Linn.! hort. Cliff. p.* 409, & *spec.* 2. *p.* 875; *Willd. enum.* 2. *p.* 884. Bellis ramosa, &c. *Cornut. Canad. t.* 194. Pulicaria annua, *Gærtn. fr.* 2. *p.* 462. Diplopappus dubius, *Cass. in bull. philom.* 1817 & 1818. Stenactis dubia, *Cass. in dict. sci. nat.* 37. *p.* 485. S. annua, *Nees, Ast. p.* 273. S. annua & S. strigosa (excl. syn.), *DC.! prodr.* 5. *p.* 299. Phalacroloma acutifolium, *Cass. in dict. l. c.* 39. *p.* 405.

Fields and waste places, Canada! and throughout the Northern States! to Kentucky! a common weed; now naturalized throughout Europe. May or June–Aug.—② or ①? Stem stout, 2–4 feet high, striate or angled. Radical and lower leaves large. Heads as large or larger than E. strigosum, but less showy; the ray (white or tinged with purple) being shorter.—*Flea-bane, Daisy.*—Nuttall says the ray has no pappus; and Nees, that it is very deciduous. We find the exterior squamellate-coroniform pappus, but no trace of an interior: both the pappus and the achenia entirely correspond with the following species; and, indeed, specimens almost intermediate between the two may sometimes be observed.

28. *E. strigosum* (Muhl.): more or less strigose with a minute appressed pubescence; stem slender, paniculate-corymbose at the summit; leaves all entire or slightly serrate; the radical and lower cauline oval or spatulate, 3-nerved, tapering into a slender petiole; the upper ones scattered, lanceolate, oblanceolate, or linear, acute or obtuse; rays narrowly linear, about twice the length of the minutely hispid or pubescent involucre.—*Muhl.! in Willd. spec.* 3. *p.* 1956; *Ell. sk.* 2. *p.* 394; *Hook.! fl. Bor.-Am.* 2. *p.* 18; *Darlingt. fl. Cest. p.* 471. E. ambiguum, *Nutt.! gen.* 2. *p.* 147. E. longifolium, *Hort. Par.*, ex *Cass.*, not of *Lam.* E. nervosum, *Pursh, l. c.*, not of *Willd.* E. spathulatum, *H. H. Eaton, in trans. med. soc. New York,* 1822. E. Philadelphicum, *Bart. veg. mat. med. t.* 20. Doronicum ramosum, *Walt. Car. p.* 205. Phalacroloma obtusifolium, *Cass. in dict. l. c.; DC. prodr.* 5. *p.* 298, excl. all the syn. Stenactis ambigua, *DC.! prodr.* 5. *p.* 299.

β. stem and leaves nearly glabrous; the latter almost constantly entire, except the lowest.—E. integrifolium, *Bigel. fl. Bost. ed.* 2. *p.* 302.

γ. slender; heads rather smaller; rays rose-color, turning nearly white.—E. Beyrichii, *Hort. Berol.!* Stenactis Beyrichii, *Fisch. & Meyer, 5th ind. sem. St. Petersb.* Phalacroloma Beyrichii, *Fisch. & Meyer. 6th ind. sem. l. c., & in Linnæa,* 14. *suppl. p.* 162. (Carolina, *Beyrich.* v. sp. in *hort. Berol.*)

Fields and open places, Canada! and from the Saskatchawan! to Florida! and Louisiana! and west to Oregon! June–Aug., or in the Southern States, April–June.—① or ②? Stem 1–3 feet high, usually much smaller and more slender than the preceding, angled or furrowed. Corymbs loose, at length rather naked. Rays white; the tube hairy. Achenia slightly hairy. Inner pappus in the disk, of about 15 slender fragile and deciduous bristles; in the ray none, or sometimes of one or two caducous bristles: the exterior a small setaceous-squamellate crown, similar in the ray and disk.—The plant infests cultivated fields and meadows, like the preceding, and is also called *Flea-bane* and *Daisy.*

§ 5. *Rays in a single series, rather few* (*about* 30), *longer than the involucre: pappus simple: achenia mostly* 4*-nerved: perennial, scapiform.*—ERIGERIDIUM.

29. *E. vernum:* nearly glabrous; radical leaves rosulate, slightly succulent, spatulate or oval, mostly petioled, obscurely toothed or entire; the cauline very few and small, or none; heads several (5–12), small, paniculate-cymose; rays narrowly spatulate-linear; scales of the involucre lanceolate, with scarious margins, slightly pubescent.—E. nudicaule, *Michx.! fl.* 2. *p.*

124; *Pursh! fl.* 2. *p.* 533; *Nutt.! gen.* 2. *p.* 147; *Ell. sk.* 2. *p.* 393. Aster vernus, *Linn.! spec.* 2. *p.* 876 (*pl. Gronov.!*); *Pers. l. c.* Doronicum lævifolium, *Walt. Car. p.* 205? Stenactis verna, *Nees, Ast. p.* 275; *DC.! prodr.* 5. *p.* 299.

Moist pine barrens, &c. Virginia! and N. Carolina! to Florida! and Louisiana! May–June.—Leaves variable in form, sometimes short and roundish, often narrowly spatulate, with a more or less elongated tapering base. Scape 1–2 feet high, slender, a little pubescent or hairy above, often simple, and with few heads; not unfrequently once or twice dichotomous, the branches bearing commonly 3 heads. Rays white (sometimes purple, *DC.*), rather broad for their length in this genus, spreading, exserted the length of the involucre. Appendages of the style, in the disk-flowers, short, triangular, often acute. Pappus (double according to Nuttall, Nees and De Candolle) in all our specimens certainly simple and in a single series; the bristles very slender, scabrous, equal, between 20 and 30 in number. Achenia oblong, 4-nerved, quadrangular or compressed, minutely hispid.

§ 6. *Rays* (30–50) *in a single series or nearly so, much longer than the involucre: pappus double; the exterior short, setaceous or squamellate-subulate: achenia mostly* 2*-nerved: receptacle areolate: perennial or suffruticose, with the habit of* Diplopappus *or* Chrysopsis, *but with the style and receptacle of* Erigeron.—PSEUDERIGERON.

30. *E. filifolium* (Nutt.): canescent, stems or branches numerous from a woody base; leaves filiform, crowded on the sterile branches, scattered on the fertile; peduncles naked, bearing single (small) heads; scales of the involucre somewhat unequal, linear-subulate; rays (white) rather few, about twice the length of the disk; achenia somewhat hairy; exterior pappus very indistinct.

α. branches elongated, nearly simple; rays about 40.—Diplopappus filifolius, *Hook.! fl. Bor.-Am.* 2. *p.* 21.

β. stems or branches paniculate-corymbose; rays 25–30.—E. filifolium, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 308. Chrysopsis canescens, *DC.! prodr.* 5. *p.* 328.

Oregon, from the Great Falls and barren grounds of the interior, *Douglas!* to the Rocky Mountains, *Nuttall!*—Stems 8–12 inches high; the sterile branches and young leaves very canescent. Leaves 2–3 inches long, very slender. Scales of the involucre rather rigid. Pappus a single series of white bristles (20 or more), with a few minute setæ intermixed, scarcely distinguishable from the hairs of the compressed 2-nerved achenia.

31. *E. Douglasii:* stem tall, glabrous, racemosely branched at the summit; the branches numerous, elongated, mostly simple and bearing solitary heads, somewhat corymbose or fastigiate; leaves (upper cauline) linear, rigid, obtuse, scabrous with minute appressed hairs; those of the branches much smaller; rays (blue or purple) about twice the length of the disk; scales of the somewhat imbricated involucre minutely pubescent, the exterior linear-subulate; the inner larger, lanceolate; achenia somewhat hairy; exterior pappus minute and indistinct.—Diplopappus? occidentalis, *Hook. & Arn.! bot. Beechey, suppl. p.* 350.

California, *Douglas!*—The original, and only specimen we have seen is imperfect, wanting the lower part of the stem, which appears to have been 2 feet or more in length: the numerous and mostly simple flexuous flowering branches are about 6 inches long: the only cauline leaves present about an inch long, 2 lines or more in breadth, 1-nerved, and slightly veiny. Heads scarcely larger than in E. Philadelphicum. Scales of the involucre narrow

and acute, not very numerous, but somewhat in 3 series, rather unequal; the inner whitish, with a brownish mid-nerve, nearly glabrous. Inner pappus of few (15–20) bristles; the exterior fewer and very small.

32. *E. decumbens* (Nutt.): scabrous-pubescent; stems slender, decumbent or ascending, glabrous at the base, leafy, numerous from the same root, somewhat branched or corymbose at the summit; the branches bearing single heads; leaves linear, entire, acute; the lower somewhat lanceolate, tapering into a petiole; rays (white, *Nutt.*) more than twice the length of the linear hairy and rather loose scales of the involucre; exterior pappus minute.—*Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 309.

Rocky Mountains towards the Oregon, *Nuttall!* Wahlamet, *Douglas!*—Stems more slender than in E. corymbosum, 10–15 inches long; the whole plant scabrous-pubescent, not hoary, leafy nearly to the summit. Leaves 2–3 inches long, often less than 2 lines wide; the lower attenuated into slender petioles. Heads as large as a Daisy, on slender peduncles. Scales of the involucre narrow, acute, nearly in a single series. Rays 40–50, in a single series.

33. *E. corymbosum* (Nutt.): canescently pubescent throughout; stems numerous from the same root, erect, bearing few (3–5) corymbose heads at the summit; leaves lanceolate-linear, entire, acute, sessile; the radical lanceolate or slightly spatulate, tapering into a petiole; rays (blue) about twice the length of the lanceolate canescent appressed scales of the involucre; achenia minutely hairy; exterior pappus squamellate-setaceous, very distinct.—*Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 308.

Rocky Mountains, in about lat. 42°, towards Oregon, *Nuttall!*—Plant 6–8 inches high, rather stout, hoary with a close and short pubescence. Leaves rather rigid, strongly 1-nerved, 1–3 inches long, about 2 lines wide. Heads middle-sized, on naked peduncles. Scales of the involucre in about 2 nearly equal series, appressed, hirsute-canescent. Rays 30 or more, in a single series. Pappus somewhat brownish; the exterior rather copious, shorter than the 2–3-nerved compressed achenia.—Habit of Chrysopsis, and with a similar exterior pappus.

34. *E. ochroleucum* (Nutt.): somewhat cæspitose, low; stems numerous from a thickened caudex, simple, slender, naked above, pubescent with appressed hairs; bearing solitary or rarely 3–5 heads; radical leaves crowded, very narrowly linear, tapering into a petiole; the cauline few or scattered, sessile; rays (ochroleucous, *Nutt.*) scarcely twice the length of the pubescent-tomentose linear-lanceolate scales of the involucre; achenia somewhat pubescent; exterior pappus squamellate-subulate, very distinct.—*Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 309. Diplopappus linearis, *Hook. fl. Bor.-Am.* 2. *p.* 21. (ex descr.) Chrysopsis hirtella, *DC. prodr.* 5. *p.* 327?

Plains of the Oregon, *Nuttall!* On dry rocks and sandy grounds near 'Priest's Rapid,' and on Lewis River, *Douglas!* Aug.—Stems 3–5 inches high, often simple and scape-like, leafless above and bearing a single head; frequently more leafy and bearing 3 or 4 heads on naked peduncles. Leaves clustered at the base, slender, 2–3 inches long, rather rigid, slightly dilated upwards or near the apex, or somewhat spatulate-linear, half a line to scarcely a line in width, resembling an Armeria, nearly glabrous when old, at first clothed with slender appressed hairs: cauline leaves nearly similar, but sessile, often almost filiform. Heads as large as in E. alpinum. Scales of the involucre nearly equal and somewhat in a double series. Rays 50 or more, in a single series. Inner pappus of few bristles.—This is with much doubt the Diplopappus linearis of Hooker, and the Chrysopsis hirtella of De Candolle (described from imperfect specimens): having yellow instead of white rays (according to Nuttall,) it certainly closely approaches Chrysopsis. The style, receptacle &c. agree with Erigeron.

35. *E. cæspitosum* (Nutt.): dwarf, canescent with a close and short pubescence; stems numerous from a thickened caudex, cæspitose, decumbent, mostly simple and terminated by single heads; leaves linear-oblong, rather obtuse, entire; the cauline sessile; the radical clustered, oblanceolate or spatulate-oblong; rays (white or pale rose-color), very numerous and somewhat in a double series, twice the length of the hirsute-tomentose involucre; achenia hairy; exterior pappus squamellate-setaceous, very distinct.—*Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 307.

β. grandiflorum: larger; stems occasionally somewhat branched; rays more than twice the length of the involucre.—Diplopappus grandiflorus, *Hook.! fl. Bor.-Am.* 2. *p.* 21.

Dry hills of the Platte, in the Rocky Mountains, and on the Colorado of the West, *Nuttall!* *β.* Plains of the Saskatchawan and prairies of the Rocky Mountains, *Drummond!*—Stems 3–5, or in *β.* often 6–8 inches high. Radical leaves in dense clusters, about 2 inches long, or in *β.* larger, obscurely 3-nerved; the cauline ½–1 inch long, obtuse or abruptly acute. Scales of the involucre appressed, narrow, very acute, the exterior shorter, the interior broader.—The head is about as large as a Daisy in Mr. Nuttall's plant: in the specimens of Drummond, the heads, as well as the whole plant, are larger, and the rays longer. Mr. Nuttall has overlooked the exterior pappus; the squamellate setæ of which, although not numerous, are as large and distinct as in any species of this section.

‡ *Species unknown to us.*

36. *E.* (Pseuderigeron) *canescens*: canescently pubescent; leaves linear-lanceolate, entire, very much narrowed at the base; the lower on long petioles; stem simple, corymbose; the branches elongated, leafy, bearing single heads; scales of the involucre narrow, very acute, hirsute-scabrous. *Hook.*—Diplopappus canescens, *Hook. fl. Bor.-Am.* 2. *p.* 21.

Saskatchawan, between Carlton House and Edmonton House, *Drummond!* —According to Hooker, this plant may possibly prove to be a variety of his Diplopappus grandiflorus, which is a large variety of E. cæspitosum, *Nutt.*; but it is said to be a taller, more erect, and corymbose plant, with smaller heads.

37. *E. lonchophyllum* (Hook.): stem tall, simple, hispid; leaves very long, linear, glabrous, nerved, ciliate; the lower ones linear-spatulate; raceme terminal, leafy, many-flowered; peduncles elongated, somewhat leafy (foliolosis); rays numerous, narrow (white?), scarcely longer than the copious pappus. *Hook. fl. Bor.-Am.* 2. *p.* 18.

Saskatchawan, *Drummond.*—Apparently a remarkable species, founded on a single specimen, said to be about 2 feet high, very hispid with spreading and rigid white hairs; the cauline leaves several of them 6 inches long and 2–4 lines broad; the heads similar to those of E. glabellum: but in the specific character the rays are said to be scarcely longer than the pappus.

38. *E. hispidum* (Nutt.): stem erect, corymbose, above scabrous and hispid; leaves entire, ciliate and scabrous on the margin; the radical spatulate; cauline sessile, acuminate; peduncles elongated, one-flowered; scales of the involucre hoary, hispid, very hirsute, much acuminated; rays very numerous. *Nutt. in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 310, not of *DC.*

"St. Barbara, California.—Nearly allied to E. speciosum, from which, however, it is very distinguishable by its exceedingly hirsute involucrum, and hispid, naked, elongated peduncles; the leaves appear, also, broader, and scabrous towards the points. Rays blue, more numerous than in E. speciosum, and not so long. Pappus double in ray and disk: rays [bristles] 20 to 24, persistent." *Nutt.*—We have not seen this plant. There is probably a typographical error in the character; the word 'hispid' should proba-

bly be applied to the peduncles, instead of the involucre. There is already an Erigeron hispidum of De Candolle (in *Wight, contrib. bot. Ind.*, & *DC. prodr.*); but we have left the name of Mr. Nuttall's species unchanged; firstly, because that of De Candolle will perhaps be removed from the genus; and secondly, we see no adequate distinction between this plant and E. speciosum.

39. *E. occidentale* (Nutt.): hispid with a short pubescence; corymb compound, irregular; lower leaves oblong-lanceolate, obtuse, subserrulate; upper linear, entire, scales of the involucre lanceolate, acute, scarcely hirsute; rays very numerous, red; inner pappus of about 12 bristles; the outer very distinct. *Nutt. in trans. Amer. phil. soc.* (*n. ser.*) *p.* 311.

"Oregon.—A low perennial species, with broadish leaves on the lower part of the stem. Allied to E. strigosum, but scarcely the same, with red flowers and broad leaves." *Nuttall.*

40. *E. foliosum* (Nutt.): rather hirsute and somewhat scabrous; stem simple, erect, terete, attenuated, the summit corymbose; leaves oblong-linear, sessile, acute, crowded; scales of the involucre lanceolate, pubescent, acute, in about 2 series, nearly equal; rays short, red, about 30; achenia somewhat hirsute. *Nutt. in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 309.

St. Barbara, California, *Nuttall.* May.—"A very remarkable species; the stem terete, full of leaves, one and a half to two inches long, and about 2 lines wide, diminishing in size with the attenuation of the stem. Pappus double; the outer small, the inner of many brownish rays. Stigma exserted, smooth and nearly equally filiform in the ray; obliquely truncate and slightly pubescent in the discal florets. Rays narrow, about the length of the involucrum [that is exserted to about that length], of a full purple red. This species appears to be considerably allied to Corethrogyne, but has the achenium of Erigeron, somewhat prismatic, with 3 or 4 longitudinal brown lines or nerves, but the obtuse stigma appears to be an anomaly in the genus." *Nutt.*—We have not seen this plant, which, in addition, is said to resemble an Aster in aspect, and to have been described from immature specimens. The appendages of the style (stigmas) are, we believe, always obtuse in Erigeron.

E. Carolinianum, of Linnæus, is wholly founded on the Virga-aurea Caroliniana, &c. *Dill. Elth. t.* 306, *f.* 394, a yellow-flowered plant, which no botanist has succeeded in identifying. It has nothing in common with the Phalacroloma obtusifolium of Cassini (which is Erigeron strigosum), nor with the Erigeron hyssopifolium, *Michx.* (which is Aster graminifolius). This confusion commenced with Pursh, who erroneously adduced the figure of Dillenius and the E. Carolinianum as synonyms of the E. hyssopifolium of Michaux.

E. longifolium (Desf. & Pers.) is pretty clearly not of this genus, and in all probability not a North American plant. Pursh adds the mark *v. s.*, but we find no specimen in Mr. Lambert's herbarium. In the list of excluded species, De Candolle refers it to Jasonia longifolia, but we find no such species described, nor have we elsewhere met with the name.

E. retroflexum (Poir.), a very imperfectly characterized species, is said to have extremely narrow linear glabrous leaves, and a short, imbricated, and very glabrous involucre. Perhaps it is Chrysopsis pinifolia, *Ell.*

28. DIPLOPAPPUS. *Cass. in bull. philom.* 1817, & *in dict.* 13. *p.* 308.

Diplostephium, *Kunth.*—Diplopappus & Diplostephium. *Cass.* (*dict.* 37.) & *D(* (excl. Diplop. § 1? & 2.)—Diplostephium & Dœllingeria, in part, *Nees.*—Chrysop§ 2, *Nutt.* partly.

Heads many-flowered; the ray-flowers 8–12, or rarely more numero in a single series; those of the disk tubular, perfect. Scales of the invol

imbricated, lanceolate or subulate, 1-nerved or carinate, destitute of herbaceous or squarrose tips. Receptacle flat, somewhat alveolate; the alveoli toothed. Appendages of the style subulate or lanceolate, rarely short. Achenia more or less compressed. Pappus double; the exterior of copious scabrous often unequal capillary bristles, as long as the corolla; the exterior very short, setulose, or setaceous-subulate.—Perennial (chiefly American) herbs or suffruticose plants, somewhat variable in habit; with alternate mostly entire and sessile leaves. Heads corymbose, or terminating the simple branches. Rays blue, purple, or white; the corolla of the disk yellow, rarely changing to purplish.

The name Diplostephium appertains to the section which comprises the original species, D. lavandulæfolium, *Kunth;* which appears to differ considerably, and perhaps generically from the Eudiplostephium of De Candolle, and is perhaps much nearer the Diplopappus § Amelloidei of the latter author.—In a note under Aster § Orthomeris, we have already observed that some, if not all of the species of De Candolle's Diplopappus § Calimeridei, with the Aster peduncularis, *Wall.* (Amphiraphis peduncularis, *DC.*), the Calimeris flexuosa, *Lindl.* &c. (all natives of the mountains of India), appear to form a well-marked genus.

§ 1. *Bristles of the inner pappus similar, not clavellate or thickened at the apex; the exterior setulose: achenia villous or silky, short, somewhat compressed: involucre about the length of the disk: leaves crowded, linear, rigid, 1-nerved, mucronulate, with serrulate-ciliate very scabrous margins: heads terminating the simple branches: rays violet.*—IANTHE. (Diplostephium § Amelloidea, *Nees.* Diplopappus § Amelloidei, *DC.*)

1. *D. linariifolius* (Hook.): stems strict, puberulent or slightly scabrous, usually several from the same root or suffrutescent base; leaves rigid, mostly spreading, linear, mucronulate, strongly 1-nerved, glabrous, with very scabrous serrulate-ciliate margins; scales of the turbinate-campanulate involucre imbricated in several series, rigid, carinately 1-nerved, at length somewhat spreading; the exterior short, lanceolate-subulate; the innermost linear, mostly obtuse; exterior pappus copious, setaceous; achenia narrow, silky-villous.—*Hook.! fl. Bor.-Am.* 2. *p.* 21; *Darlingt.! fl. Cest. p.* 473. D. linariifolius & D. rigidus, *Lindl.! in DC. prodr.* 5. *p.* 277. Diplostephium linariifolium, *Nees, Ast. p.* 199. Chrysopsis linariifolia, *Nutt.! gen.* 2. *p.* 152. Aster linariifolius, *Linn.! spec.* 2. *p.* 874; *Michx.! fl.* 2. *p.* 110; *Pursh, fl.* 2. *p.* 545; *Ell.! sk.* 2. *p.* 365. A. rigidus, *Linn. l. c.* (fide pl. *Gronov.!*); *Michx.! l. c.; Pursh! fl.* 2. *p.* 544. (excl. syn. A. nemoralis, *Willd.*) A. pulcherrimus, *Lodd. bot. cab.* 1. *t.* 6. A. Americanus frutescens, &c. *Pluk. alm. t.* 14, *f.* 7.

Dry soil, throughout the United States! also in Canada! and Newfoundland, *Mr. Cormack!* (in *herb. Hook.*) Sept.–Oct.—Stems 8–20 inches high, simple and terminated by a single head; or with few or numerous, simple, leafy, corymbose, clustered, or somewhat racemose branches. Leaves near the root short and scale-like, appressed, obtuse, 1–3-nerved, rigidly ciliate; the other cauline ones about an inch long, very numerous, mostly spreading or recurved, shining above, pale and with the midrib prominent beneath, veinless; those of the somewhat hoary branches much smaller, the uppermost subulate. Heads rather large; the numerous scales of the involucre somewhat ciliate; the inner often with purplish tips. Rays 10–12, elongated, showy. Appendages of the style attenuate-subulate, hairy.—We know not how the D. rigidus, *Lindl.* &c. is to be distinguished, even as a

variety. The involucre, at first more or less turbinate, becomes somewhat hemispherical when old.

2. *D. ericoides:* strigosely canescent; stems branching from near the suffrutescent? base; leaves acerose-subulate, imbricated, mucronate-piliferous; scales of the involucre lanceolate-linear, acute, 1-nerved, with scarious margins, loosely imbricated in about 3 series; exterior pappus very minute; young achenia pubescent.—Inula? ericoides, *Torr.! in ann. lyc. New York*, 2. *p.* 212. Chrysopsis ericoides, *Eaton, man. bot.* Eucephalus ericoides, *Nutt. in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 299.

On the Canadian River? *Dr. James!* (collected in Long's expedition to the Rocky Mountains.)—Plant apparently 6–8 inches high, clothed quite to the summit of the branches with appressed strigose and hispidly-ciliate heath-like leaves; those near the base 2 or more lines long; those of the branches scarcely a line long, thickened, concavo-convex, obscurely 1-nerved. Heads solitary, rather small. Scales of the involucre rather few. Rays 10–15, longer than the disk, apparently not yellow; the disk-flowers about 12. Appendages of the style oblong, much shorter than the stigmatic portion. Pappus of rather few capillary bristles; the exterior of about as many in proportion to the inner as in D. linariifolius.

3. *D. alpinus* (Nutt.): stems several from the suffrutescent base, simple, tomentose-pubescent, naked at the summit; leaves crowded, erect, linear-oblong, mucronulate, rather rigid, scabrous, villous-pubescent when young, 1-nerved, flat, with cartilaginous minutely serrulate-scabrous margins; scales of the hemispherical involucre linear, acute, 1-nerved, with scarious margins, pubescent, imbricated in about 3 series; exterior pappus of rather numerous setaceous bristles; young achenia compressed, silky-villous.—*Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 304. Chrysopsis alpina, *Nutt.! in jour. acad. Philad.* 7. *p.* 34, *t.* 3, *f.* 2.

Rocky Mountains, near the Flat Head River, *Mr. Wyeth!* June.—Plant 3–4 inches high. Leaves about 4 lines long and one in breadth. Heads as large as in D. linariifolius; the rays "pale violet-purple," 12–15, elongated. Appendages of the style subulate-linear, as long as the stigmatic portion.

§ 2. *Bristles of the inner pappus unequal, some of them* (*the innermost*) *clavellate or slightly thickened at the summit; the exterior of copious short slightly squamellate bristles: achenia* (*pubescent or glabrous*) *obovoid, more or less compressed,* 5–8*-nerved: involucre shorter than the disk: leaves scattered, membranaceous, veiny, entire: heads in compound corymbs: corolla of the disk deeply* 5*-toothed: rays* 8–12, *white, or somewhat ochroleucous.*—TRIPLOPAPPUS. (Species of Dœllingeria, *Nees.* Diplostephium § 1. Eudiplostephium, *DC.*)

* *The longer bristles of the inner pappus with manifestly clavellate tips: appendages of the style linear-subulate, elongated.*

4. *D. cornifolius* (Darlingt.): stem slender, terete, pubescent-scabrous above, sparingly corymbose-paniculate at the summit; leaves elliptical, or broadly lanceolate, conspicuously acuminate at each end, ciliate, hairy on the veins beneath; heads few, scarcely corymbose, on divaricate pedicels; achenia glabrous.—*Darlingt.! fl. Cest. p.* 475. Dœllingeria cornifolia, *Nees, Ast. p.* 181. Diplostephium cornifolium, *DC.! prodr.* 5. *p.* 273. Aster Americanus latifolius albus, &c. *Pluk.! alm. p.* 56, *t.* 79, *f.* 1. A. caule infirmo, foliis ovatis, &c. *Gronov.! Virg. ed.* 1. *p.* 99. A. divaricatus *Linn.! spec.* 2. *p.* 873 (ex syn. *Pluk. & Gronov.* supr. cit.); not of *herl Linn.; Spreng. syst.* 3. *p.* 529? A. cornifolius, *Muhl. in Willd. spec.*

p. 2039; *Bigel. fl. Bost. ed.* 2. *p.* 313. A. infirmus, *Michx.! fl.* 2. *p.* 109. A. humilis, *Pursh, fl.* 2. *p.* 548 (excl. syn. *Willd.*); *Ell. sk.* 2. *p.* 366. Chrysopsis humilis, *Nutt. gen.* 2. *p.* 153?

Woodlands &c. from (Canada, *Michaux,*) Massachusetts, New York! and Pennsylvania! to Virginia! and the mountains and upper country of the Southern States! Aug.–Sept.—Stem 1–2 feet high, sometimes flexuous. Leaves somewhat rhombic-oblong or oval (the uppermost oblong-lanceolate), tapering to the base and almost petioled, 2–4 inches long, 1–2 wide. Heads larger and much fewer than in the following, 2–5 on the somewhat paniculate branches; or very loosely corymbose at the summit. Scales of the involucre oblong-lanceolate, obtuse, slightly pubescent; the innermost shorter than the disk, the exterior very short. Achenia large, obovoid, fuscous, turgid, but evidently compressed, 7–8-nerved, viz: with one nerve on each margin, and 3 on one side and 2 or 3 on the other. Pappus reddish-brown; the exterior very copious; a large portion of the interior clavellate and obtuse.—**A very distinct species.**

* * *The longer bristles of the inner pappus slightly thickened towards the summit (under a lens), but scarcely clavellate: appendages of the style short, triangular-subulate or oblong.*

5. *D. amygdalinus:* stem slightly striate, smooth, or scabrous above, corymbosely branched at the summit; leaves ovate-lanceolate, oblong, or sometimes oval, more or less acute or acuminate, scabrous-ciliolate, sessile, or abruptly narrowed into a slight petiole; heads numerous, in loose corymbs; scales of the short involucre loosely imbricated, obtuse; achenia minutely hairy.—Aster amygdalinus, *Lam. dict.* 1. *p.* 305? (excl. syn. Ast. Acadiensis, &c. *Tourn. herb.*); *Ell.! l. c.* (partly.) A. humilis, *Willd. spec.* 3. *p.* 2038, & *hort. Berol. t.* 67, fide *Nees.* Chrysopsis amygdalina, *Nutt. l. c.?* Diplostephium amygdalinum, *Cass. in dict. sci. nat.* 37. *p.* 486? Dœllingeria amygdalina, *Nees, Ast. p.* 179.

β. stem branching; heads rather large.—D. cornifolius, *Lindl.! in herb. Torr.* (partly.)

γ. more scabrous and rigid; heads smaller.—Dœllingeria cornifolia, *Lindl.! in Hook.! compan. to bot. mag.* 1. *p.* 98.

Moist places, New Jersey! Pennsylvania? and throughout the Southern States! *β.* Alabama, *Dr. Gates!* Louisiana, *Dr. Hale!* Arkansas, *Dr. Pitcher!* *γ.* Louisiana, *Drummond! Dr. Leavenworth!* Aug.–Sept.—Stem 1–3 feet high, often producing straggling branches. Leaves shorter and broader than in the following, sometimes ovate or oval and obtuse, but usually acute or acuminate. Scales of the involucre scarcely longer than the mature achenia, nearly glabrous. Achenia and pappus nearly as in D. umbellatus. —Both this and the following species are subject to considerable variation, and perhaps are not always readily discriminated, but we think they are distinct. This species is nearly confined to the southern portion of the United States, while the following abounds in the Northern States and Canada. ey are not satisfactorily distinguished by those who recognize two species, a portion of the synonymy is very uncertain. Perhaps the original A. rgdalinus, as well as A. umbellatus, was founded on the present species s certainly the case with the plant cited from Tournefort's herbarium), ugh Lamarck's plant is said to have been derived from Virginia.

D. *umbellatus:* stem striate, smooth or somewhat scabrous, fastigiate-bose at the summit; leaves elongated lanceolate, attenuate-acuminate, g at the base usually into a slight petiole, the margins ciliate-scabrous; umerous, usually in fastigiate corymbs; scales of the short involucre ob- rather closely imbricated; achenia minutely hairy.—D. umbellatus

& D. amygdalinus, *Hook.! fl. Bor.-Am.* 2. *p.* 23. D. amygdalinus, *Darlingt.! fl. Cest. p.* 473. Dœllingeria umbellata, *Nees, Ast. p.* 178. Diplostephium umbellatum, *DC. l. c.* Aster umbellatus, "*Mill. dict. ed.* 7. *no.* 2"; *Ait.! Kew.* (*ed.* 1) 3. *p.* 199; *Willd. spec.* 3. *p.* 2030; "*Hoffm. phytogr. bl. p.* 74, *t. B. f.* 2." (ex *Nees.*); *Bigel. fl. Bost. ed.* 2. *p.* 310. A. amygdalinus, *Michx.! fl.* 2. *p.* 109; *Pursh, fl.* 2. *p.* 549; *Ell. l. c.* (partly); *Torr.! compend. p.* 300; *Lindl. bot. reg. t.* 1517.

β. low and small; corymb simple.—Diplostephium amygdalinum, *β.* humilius, *DC.! l. c.*

Moist thickets, &c. Canada! and Nova Scotia! and common throughout the Northern and North Western States! to the mountains of South Carolina. *β.* Newfoundland, *Pylaie! Mr. Morrison!* &c. Aug,–Sept.—Stem 2–5 feet high, simple below, above with rather strict corymbose branches. Leaves 3 to 4 or 5 inches long, either narrowly lanceolate or oblong-lanceolate, glabrous, pale beneath. Scales of the involucre (not longer than the ripe achenia) slightly pubescent and ciliate. Achenia obovoid oblong, somewhat compressed, 3–5-nerved or ribbed. Pappus pale or tawny.

7. *D. obovatus:* clothed with a minute short pubescence: stem terete, corymbose at the summit; leaves closely sessile, oval, elliptical, or occasionally somewhat obovate, mostly obtuse at each end, conspicuously reticulated, tomentose-pubescent beneath; heads rather numerous; scales of the involucre, linear, acute, pubescent and viscid, imbricated in about 3 series; achenia pubescent-villous.—Chrysopsis obovata, *Nutt.! gen.* 2. *p.* 152. Solidago Noveboracensis, *Muhl.! herb.* Aster obovatus, *Ell. sk.* 2. *p.* 368. Diplostephium boreale, *Spreng. syst.* 3. *p.* 544. D. obovatum, *DC. prodr.* 5. *p.* 273. Dœllingeria obovata, *Nees, Ast. p.* 182.

β. corymb dichotomous-paniculate; peduncles elongated, naked; heads fewer.—Aster dichotomus, *Ell.! sk.* 2. *p.* 366. Diplostephium dichotomum, *DC. l. c.*

Damp shady soil, S. Carolina and Georgia, *Le Conte! Nuttall! Elliott!* to Florida, *Dr. Chapman! Dr. Leavenworth!* June–Oct.—Stem 2–3 feet high, often numerous from the same root. Leaves numerous, 2–3 inches long, an inch or more wide, somewhat membranaceous, often a little narrowed towards the base, slightly puberulent-scabrous above; the veins diverging at right angles from the midrib, and conspicuously reticulated beneath. Heads as large as in D. cornifolius, either loosely corymbose, or somewhat paniculate, usually on slender tomentose-pubescent peduncles. Involucre shorter than the disk, at length scarcely exceeding the slender achenia. Rays 10–13, white (sometimes tinged with purple), nearly thrice the length of the involucre. Achenia oblong, about 5-angled or nerved, scarcely compressed. Pappus white, or at length tawny; the exterior not very copious; the interior very obscurely, if at all, thickened towards the summit.—The plant is sometimes considerably branched; and, according to Elliott, the leaves are rarely toothed. We have met with no specimen in Elliott's herbarium under the name of Aster obovatus; but his A. dichotomus is a mere state of this species.

‡ *Doubtful Species.*

8. *D. leucophyllus* (Lindl.): shrubby? woolly throughout; branches short, bearing single heads; leaves thick, oval, acute, crenate, narrowed into a petiole; scales of the squamose involucre linear, membranaceous, the upper ones naked; achenia tomentose, fusiform; exterior pappus short; the inner very unequal, subulate. *Lindl. in DC. prodr.* 5. *p.* 278.

California.—Probably collected by Douglas, but this is not mentioned. We have ventured to adduce this species as a synonym of Corethrogyne filaginifolia; with which, however, the character does not altogether accord.

29. TOWNSENDIA. *Hook. fl. Bor.-Am.* 2. *p.* 16, *t.* 119.

Heads subglobose, many-flowered; the ray-flowers numerous in a single series, pistillate, but sometimes infertile; those of the disk tubular, perfect. Scales of the involucre numerous and closely imbricated, appressed, lanceolate, with scarious margins. Receptacle flat, naked, areolate-fimbrillate. Rays linear, often erect; the corolla of the disk infundibuliform, 5-toothed. Branches of the style lanceolate, rather acute, hairy towards the summit. Achenia of the disk flat, obovate-oblong, pubescent or hairy, the margins 1-nerved; those of the ray 3-nerved. Pappus of the disk-flowers composed of numerous rather rigid and uniform barbellate-scabrous bristles, as long as the corolla (slightly cohering at the base? persistent); that of the ray of fewer short subulate bristles or squamellæ, sometimes with one or two slender bristles intermixed.—Dwarf acaulescent or subcaulescent herbs (natives of the Rocky Mountains and the banks of the rivers which rise on their eastern slope); with a branching caudex or a perpendicular root, and crowded linear or spatulate entire leaves. Heads large for the size of the plant, sessile or nearly so at the summit of the caudex, or of the proliferous branches. Rays rose-color or nearly white.

§ 1. *Root perennial; the caudex somewhat ligneous: rays fertile; the short pappus squamellate-subulate, and mostly with one or two capillary bristles resembling those of the disk.*—TOWNSENDIA proper.

1. *T. sericea* (Hook.! l. c.): stemless; leaves spatulate-linear, silky-canescent, erect, surrounding and partly concealing the sessile heads; scales of the involucre subulate-lanceolate; rays long and narrow, with the margins involute; receptacle areolate; achenia hairy; pappus of the ray composed of several unequal subulate bristles much shorter than the achenium, and one or two long ones nearly resembling those of the disk-flowers.—Aster? exscapus, *Richards.! appx. Frank. journ. ed.* 2. *p.* 32.

β. heads and flowers smaller; leaves narrower.—T. sericea, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 304.

Carlton House on the Saskatchawan, *Richardson!* to the Rocky Mountains in about lat. 54°, *Drummond!* *β.* Black hills towards the sources of the Platte in lat. 41°, *Nuttall!* April–May.—Root perpendicular, elongated; the caudex simple or divided, thick, very short; the whole plant not rising more than 2 inches in height. Leaves obscurely 1-nerved, 12–15 lines long, mostly overtopping the sessile heads, which are ordinarily about 8 lines in length. Scales of the involucre pubescent, green in the centre (or purplish towards the tip); the margins scarious and lacerate-ciliate. Rays not spreading. Pappus of the disk white, longer than the corolla; the bristles somewhat unequal, in about 2 rows; the exterior thickened towards the base, the interior more slender. Hairs of the achenium minutely capitate.—The flower-bud, according to Dr. Richardson, is formed in the autumn and expands the following spring.

2. *T. incana* (Nutt.): caudex, or rather stems, branching; leaves silky-canescent, oblong-spatulate, tapering into a petiole, crowded, surrounding the (small) sessile heads; scales of the involucre oval-oblong, rather acute; rays linear, flat; receptacle somewhat alveolate-fimbrillate; achenia minutely

hairy; pappus of the ray composed of nearly equal subulate setaceous bristles, shorter than the achenium.—*Nutt. ! in trans. Amer. phil. soc. l. c. p.* 305.

Near the sources of the Platte in the Rocky Mountains, *Nuttall!*—Plant about 2 inches high, densely cæspitose and depressed, inclined to produce dichotomous stems. Leaves about half an inch long, indistinctly petioled. Heads smaller than in T. sericea. Scales of the involucre silky-pubescent, with broad scarious and conspicuously fimbriate-ciliate margins. Rays not twice the length of the disk, pale lilac; the pappus resembling that of the disk, but shorter.

§ 2. *Root perennial: pappus deciduous in a ring; that of the scarcely exserted fertile rays equalling that of the disk.*—UROPHORUS, Nutt.

3. *T. spathulata* (Nutt.! l. c.): densely cæspitose; caudex branched; leaves spatulate or obovate, silky-villous, narrowed into a petiole as long as the limb, crowded, and nearly enclosing the (small) sessile heads; scales of the involucre lanceolate, acute, scarious; receptacle somewhat alveolate.

On the Black Hills of the Platte, with the preceding, *Nuttall!*—Plant 1–3 inches high. "Achenia oblanceolate, margined, slightly pubescent on the disk, and usually naked by the escape of the deciduous (barbellate) pappus, which is not the case in any of the preceding. Though the habit is nearly similar, the present plant probably constitutes an allied genus." *Nutt.*—Our specimens are too old, and have lost their achenia as well as pappus. Perhaps the latter is also deciduous in the other species, when the fruit is fully mature.

§ 3. *Root annual, thickened at the summit, and producing depressed branching stems: rays pistillate but infertile; the short pappus composed of lacerate-denticulate squamellæ, often somewhat united at the base.*—NANASTRUM. (Subgen. Nanodia, *Nutt.*, not of *Banks.*)

4. *T. strigosa* (Nutt.! l. c.): depressed; leaves strigose-canescent, linear-spatulate; the uppermost often involucrate around the base of the slightly pedunculate heads; scales of the involucre lanceolate-oblong, fimbriate-ciliolate; rays 12–14 (rose-color), short; achenia minutely pubescent.

Black Hills, near the banks of the Platte, *Nuttall!* June.—Plant 2–4 inches high. Heads scarcely as large as in T. sericea. Scales of the involucre scarious, except the greenish line in the centre. Pappus of the ray barely visible to the naked eye, composed of a single series of squamellæ, somewhat united or coroniform.

5. *T. grandiflora* (Nutt.! l. c.): divaricately branched from the base; the branches depressed, often proliferous; leaves scattered, linear-lanceolate, acute, minutely pubescent; the uppermost bracteate at the base of the (large) heads; scales of the involucre narrowly lanceolate, subulate-acuminate, with fimbriate-ciliolate margins; rays 25–30, elongated (pale lilac); achenia minutely hairy.

Black Hills, and plains of the Upper Platte, *Nuttall! Dr. James!* June.—Central stems short, erect, bearing a single head; the lateral decumbent, extending 5 to 10 inches along the ground, often branching and bearing 3 or 4 heads. Leaves 1–2 inches long, somewhat succulent; the cauline alternate. "Heads nearly as large as those of the China Aster. The plant well deserves cultivation, from its large showy flowers." *Nuttall.*—The pappus is very similar to that of the preceding species.

30. CHÆTOPAPPA. *DC. prodr.* 5. *p.* 301. (1836.)

Chætanthera, *Nutt.*, not of *Ruiz & Pavon.*—Chætophora, *Nutt. in herb. DC.*, not of *Agardh.*—Diplostelma, *Raf.* (1836.)

Heads about 20-flowered; the ray-flowers 8–12, pistillate, in a single series; those of the disk tubular, perfect; the central mostly infertile or abortive. Scales of the involucre about 12, lanceolate, acute, rigid, with scarious margins, loosely imbricated in 2–3 series, carinately 1-nerved; the outermost shortest. Receptacle narrow, naked. Rays linear-oblong; the corolla of the disk infundibuliform-tubular, 5-lobed. Style somewhat included; the branches short, very obtuse. Achenia nearly terete, somewhat fusiform, 5-striate, slightly hairy. Pappus of the ray and fertile disk-flowers similar, double; the exterior of 1–5 very small hyaline scales; the interior of 5 rigid scabrous bristles nearly the length of the corolla: that of the central mostly infertile flowers simple and similar to the exterior pappus of the fertile flowers, or coroniform, the bristles wanting.—A small annual herb (4–10 inches), diffusely branching from the base, minutely strigose. Leaves alternate, entire; the radical and lowermost obovate-spatulate, tapering into a petiole; the upper linear. Heads terminating the branchlets, solitary or loosely paniculate. Flowers of the ray pale purple or white.

C. asteroides (DC.! l. c.)—Chætanthera asteroides, *Nutt.! in jour. acad. Philad.* 7. *p.* 111. Chætophora asteroides, *Nutt.! in herb. DC.* Asteridium ramosissimum, *Engelmann! mss. in herb. Berol.*

Prairies and naked places, Arkansas, *Nuttall! Dr. Engelmann! Dr. Leavenworth!* to Texas, *Drummond!* March–May.—Heads about the size of those of Erigeron Canadense. Involucre turbinate-campanulate, glabrous. Rays elongated, convolute when dry; the tube slender.—We have described this plant somewhat differently from either Nuttall or De Candolle. The pappus of the ray and of the exterior perfect flowers is absolutely similar in all our specimens; but several of the central flowers, although perfect, are smaller and apparently always infertile; in these the inner pappus is wanting, and the exterior often only rudimentary and coroniform. The plant begins to flower when the stems or branches are about 2 inches high: later in the season it branches very much, and the numerous heads are borne on setaceous divaricate peduncles.

31. BOLTONIA. *L'Her. sert. Angl. p.* 27; *DC. prodr.* 5. *p.* 301.

Heads many-flowered; the ray-flowers pistillate, in a single series; those of the disk tubular, perfect. Scales of the hemispherical involucre imbricated somewhat in 2 series, appressed, scarcely the length of the disk, with somewhat membranaceous margins. Receptacle hemispherical or conical, obscurely alveolate. Branches of the style linear-oblong, with very short appendages. Achenia compressed, flat, obovate or slightly obcordate, margined with a callous wing, in the ray often 3-winged, glabrous or sparsely and minutely hispid. Pappus of several minute setose bristles, and frequently with 2 (or sometimes 3–4) more or less elongated subulate awns.—Perennial gla-

brous and somewhat glaucescent paniculately branched herbs, with the habit of Aster. Leaves mostly vertical, lanceolate, sessile, entire, or the lower rarely serrate, with scabrous and somewhat cartilaginous margins. Heads rather small, loosely corymbose or paniculate. Rays white or purplish.

1. *B. asteroides* (L'Her. l. c.): achenia broadly oval, glabrous; pappus of 4 or 5 minute setulose teeth, similar in the disk and ray, deciduous; heads loosely corymbose; leaves lanceolate, entire, or the lower obscurely serrate. —*Ait.! Kew.* (*ed.* 1) 3. *p.* 197; *Michx.! fl.* 2. *p.* 132; *Nees, Ast. p.* 236; *DC.! l. c.* Matricaria asteroides, *Linn. mant. p.* 116. Chrysanthemum Carolinianum, *Walt.! Car. p.* 204.

Pennsylvania, *Bartram*, (*Linn.*) and along the mountains to the Southern States!—Heads larger than in B. diffusa, but rather smaller than in B. glastifolia, which it closely resembles, and from which it is distinguished by the minute pappus. This would appear to be a rare species; as we possess only a single specimen, collected in Burke County, N. Carolina, by Mr. M. A. Curtis; and Elliott did not meet with it in the low country of the Southern States.

2. *B. glastifolia* (L'Her. l. c.): achenia obovate, broadly winged, often slightly hairy; pappus of several very short bristles, and (especially in the disk) with 2, or sometimes 3–4, more or less elongated slender awns; heads loosely corymbose; leaves lanceolate, the lowest often serrate.—*Ait.! l. c.*; *Michx.! l. c.*; *Willd. spec.* 3. *p.* 2161; *Sims, bot. mag. t.* 2381; *Ell. sk.* 2. *p.* 399; *Nees, Ast. p.* 235; *Hook. fl. Bor.-Am.* 2. *p.* 23; *DC.! l. c.*

β. ? decurrens: leaves elongated lanceolate, rather thin, decurrent on the stem; the broad decurrent portions usually terminated by short and triangular divaricate lobes, thus appearing sagittate.

Swamps and wet places, Upper Canada, Pennsylvania! and nearly throughout the Southern and Western States! *β.* Wet prairies of Illinois, *Dr. Short!*—Plant 3–7 feet high. Leaves 3–5 inches long, tapering to the base, or oblanceolate. But in var. *β.* which is perhaps a distinct species, the leaves are of the same breadth throughout in the only specimen we have seen, those of the branches closely sessile; the cauline (upper) strikingly decurrent.

3. *B. diffusa* (Ell.): achenia obovate, rather narrowly winged; pappus of several very short bristles, and 2 short subulate awns; heads (small) diffusely paniculate; branches and branchlets very numerous and slender; cauline leaves linear-lanceolate, entire; those of the branches small, linear; those of the branchlets subulate.—*Ell. sk.* 2. *p.* 400; *Hook. compan. to bot. mag.* 1. *p.* 97; *DC.! prodr.* 5. *p.* 301. B. asteroides, *Sims, bot. mag. t.* 2554, ex *DC.*

Damp soil, throughout the Southern and Southwestern States from Georgia! to Western Louisiana! common. Aug.–Oct.—Stem 2–7 feet high, very diffusely branched from near the base. Heads not more than half the size of the preceding: the achenia small in proportion; the stout awns not half their length.

Subdiv. 2. BELLIDEÆ, *DC.*—Pappus none, or coroniform and minute.

32. BELLIS. *Linn.*; *Gærtn. fr. t.* 168; *DC. prodr.* 5. *p.* 304.

Heads many-flowered; the ray-flowers pistillate, in a single series; those of the disk tubular, perfect. Involucre campanulate; the scales somewhat in a double series, foliaceous, herbaceous, or somewhat membranaceous, equal.

Receptacle conical, slightly alveolate. Branches of the style short and broad. Achenia obovate, compressed, slightly hairy or hispid. Pappus none.—Low herbs (natives of Europe, with a single exception), either acaulescent and perennial, or caulescent and annual. Leaves mostly obovate or spatulate. Heads solitary, terminating the scape or branches. Rays violet-purple, rose-color, or white.—*Daisy*.

§ *Annual: stems branched.*—Kyberia, *Neck.*

1. *B. integrifolia* (Michx.): stem diffusely branched; leaves entire, sparsely hairy and ciliate; the radical and lowermost spatulate-obovate, scarcely petioled; the upper lanceolate or oblong, sessile; peduncles elongated; scales of the involucre lanceolate-ovate, acuminate, with membranaceous margins; achenia somewhat scabrous.—*Michx.! fl. 2. p.* 131; *Hook.! bot. mag. t.* 3455; *DC.! l. c.* Eclipta integrifolia, *Spreng.*, ex syn. Astranthium integrifolium, *Nutt.! in trans. Amer. phil. soc. l. c.*

Along streams and in prairies, Kentucky! Tennessee! Arkansas! and Texas! March–June.—Stems 4–12 inches high. Heads about as large as the true Daisy (B. perennis); the ray pale purple or violet. Scales of the involucre clothed with scattered hairs, acuminate into a bristly point. Appendages of the style a little longer than in B. annua. Rays pistillate, and apparently always fertile.—This appears to be a true congener of Bellis annua, as Hooker has remarked.

33. APHANOSTEPHUS. *DC. prodr. 5. p.* 310.

Heads many-flowered; the ray-flowers pistillate; those of the disk tubular, perfect. Scales of the involucre imbricated in a double series, lanceolate, acute or acuminate, with scarious margins. Receptacle conical, large, naked. Rays linear, twice the length of the involucre; the corolla of the disk tubular, 5-toothed, narrowed at the base. Branches of the style short, flat, terminated by a very short obtuse flattened cone. Achenia terete, obscurely striate, nearly glabrous. Pappus exceedingly minute, coroniform, nearly entire.—Annual? or perennial pubescent and branching (Mexican and Texan) herbs. Leaves alternate, incisely toothed or lobed. Heads solitary, pedunculate, terminating the branchlets. Rays white.

The genus should perhaps be removed to the Subtribe Anthemideæ; as De Candolle has suggested.

1. *A. Riddellii*: perennial; stems branched from the base, erect; radical and lower cauline leaves lanceolate-spatulate or nearly linear, acutely and incisely toothed towards the apex, tapering below into a long and slender petiole; those of the branches narrowly linear, entire, crowded.

Texas, *Dr. Riddell!*—Root ligneous, acrid to the taste. Stems rigid, slender, 6–8 inches high; the flowering branchlets slender, naked towards the summit. Leaves minutely hirsute-pubescent and somewhat canescent. Heads smaller than in Bellis integrifolia, but very similar in appearance. Receptacle nearly the length of the involucre.—From A. ramosissimus, *DC.* this species appears to differ chiefly in its sharply toothed and conspicuously petioled lower leaves (those of the branches more crowded), and in the rather larger flowers; characters which are perhaps inconstant, and not of specific importance.

34. BRACHYCOME. *Cass. dict.* 37. *p.* 464 & 491; *DC. prodr.* 5. *p.* 305, & 7. *p.* 276; *Benth. enum. pl. Hugel. p.* 59.

Heads many-flowered; the ray-flowers pistillate, in a single series; those of the disk tubular, perfect. Scales of the campanulate or hemispherical involucre in 2–3 series, appressed, with membranaceous margins. Receptacle conical, somewhat alveolate. Achenia compressed, or nearly terete, crowned with an inconspicuous squamellate setulose pappus.—Low herbs, with the habit of the annual species of Bellis; chiefly perennial, and natives of Australia. Rays white.

1. *B. xanthocomoides?* (Less.): diffusely branched from the base; the branches somewhat pubescent with appressed hairs, naked at the summit and bearing solitary heads; leaves nearly glabrous, entire; the lower oblong-spatulate; those of the branches lanceolate-linear, sessile; scales of the involucre oblong-lanceolate, acute, with broad scarious margins.—*Less. syn. p.* 192, & *in Linnæa*, 9. *p.* 265?

Texas. *Drummond!* (v. sp. in *herb. B. D. Greene.*)—The specimen which we describe was mixed with some other plants in Drummond's Texan collection, and not numbered. The plant resembles Bellis integrifolia in aspect, but is smaller, and the heads not half the size: the involucre is very similar; the scales in 2 series, herbaceous in the centre. Rays about 3 lines long, white. Corolla of the disk cyathiform, expanded, deeply 5-toothed, the proper tube very short. Style in the disk-flowers with broadly oblong flat branches, bordered with very thick stigmatic lines, and terminated with a short and flat triangular minutely hairy appendage. Achenia (immature) somewhat compressed and obovate, minutely hispid, crowned with a single series of distinct squamellate-setulose bristles, scarcely exceeding the short hairs of the achenium. We have not seen the lower leaves; and Lessing does not describe the achenia or the style of his plant, which was collected in Mexico by Shiede. Our plant appears to accord with the Australian Brachycomes, and only differs from the annual species of Bellis in the minute pappus; and when we consider that a perennial Spanish Bellis (B. papulosa, *Boiss.*) exhibits a similar pappus, it is evident that the present genus scarcely deserves to be distinguished.

Div. 2. CHRYSOCOMEÆ, *DC.*—Heads either heterogamous and radiate, or homogamous and discoid (both forms sometimes occurring in the same genus); the rays and disk-flowers yellow and unchanging. Receptacle never chaffy.

CONSPECTUS OF THE GENERA.

191 *Subdiv.* 1. GYMNOSPERMEÆ.—Pappus none.

35. GYMNOSPERMA. Rays few, very small.

192 *Subdiv.* 2. ACHYRIDEÆ.—Pappus chaffy or coroniform.

36. AMPHIACHYRIS. Achenia of the disk abortive, the narrow scales of the pappus united at the base; of the ray fertile, with a short pappus.

37. GUTTIERREZIA. Achenia of the disk and ray fertile.

194 *Subdiv.* 3. SOLIDAGINEÆ.—Pappus similar in the disk and ray (when the latter is present), simple, of capillary or rigid, rarely squamellate or awn-like bristles.

* *Pappus of very short squamellate bristles.*

38. BRACHYCHÆTA. Rays and disk-flowers each 4–5. Lower leaves cordate.

* * *Pappus of elongated capillary bristles.*

39. SOLIDAGO. Rays few, rarely none; disk-flowers several. Receptacle alveolate.
40. BIGELOVIA. Rays none: disk-flowers 3–4. Receptacle cuspidate.
41. LINOSYRIS. Rays none: disk-flowers 5–many. Receptacle alveolate-toothed. Achenia oblong, silky-villous.
42. AMMODIA. Rays none: disk-flowers numerous. Scales of the involucre scarious-membranaceous. Achenia attenuate, hairy.
43. MACRONEMA. Rays 6–8, or none: disk-flowers numerous. Scales of the involucre scarcely in two series, with foliaceous tips. Achenia flat, hairy.
44. ERICAMERIA. Rays 3–6: disk-flowers 7–9. Scales of the oblong or cylindrical involucre imbricated. Achenia glabrous. Pappus copious.
45. STENOTUS. Rays 8–12: disk-flowers numerous. Scales of the hemispherical involucre broad, closely imbricated. Achenia silky-villous. Pappus copious, unequal.
46. ISOPAPPUS. Rays 5–12: disk-flowers 10–20. Scales of the cylindrical involucre lanceolate-subulate. Achenia villous. Pappus equal, in a single series.

* * * *Pappus of numerous unequal bristles, more or less rigid.*

47. APLOPAPPUS. Achenia oblong or turbinate, villous or silky. Pappus of copious unequal and rather rigid persistent bristles.
48. PYRROCOMA. Achenia linear, angled, glabrous. Pappus of copious uniform slender and rigid persistent bristles.
49. PRIONOPSIS. Achenia ovoid, glabrous. Pappus of very unequal deciduous bristles; some of them very rigid.
50. CENTAURIDIUM. Achenia turbinate, pubescent. Pappus of several nearly definite subulate persistent bristles.

* * * * *Pappus of few rigid awns or bristles.*

51. GRINDELIA. Pappus of 2–8 corneous caducous awns.
52. PENTACHÆTA. Pappus of 5 persistent rigid bristles.

250 *Subdiv.* 4. HETEROTHECEÆ.—Pappus of the ray and disk dissimilar.

53. BRADBURIA. Pappus of the ray double; the exterior of short and squamellate, the interior of capillary barbellate bristles; that of the disk of 2 chaffy awns.
54. HETEROTHECEÆ. Pappus of the ray none; of the disk as in Chrysopsis.

252 *Subdiv.* 5. CHRYSOPSIDEÆ.—Pappus of the ray and disk similar, double.

55. CHRYSOPSIS. Exterior pappus short, setose or chaffy; the inner capillary.

Subdiv. 1. GYMNOSPERMEÆ, *DC.*—Pappus entirely wanting.

35. GYMNOSPERMA. *Less. syn. p.* 194; *DC. prodr. 5. p.* 311.

Heads 8–14-flowered; the ray-flowers 3–5 (sometimes wanting), very narrow, and with an extremely short ligule, pistillate; those of the disk tubular and perfect, sometimes sterile. Involucre oblong; the scales imbricated, appressed, scarious-coriaceous. Receptacle narrow, naked. Corolla of the disk with a cyathiform 5-cleft limb; the lobes oblong-lanceolate, revolute. Branches of the style oval or oblong; the appendages as long as the stigmatic

portion. Achenia oblong-cylindrical, slightly compressed, destitute of pappus.—Suffruticose and fastigiately branched (American) plants, glabrous, mostly glutinous or varnished, with the habit of Solidago § Euthamia. Leaves alternate or sometimes opposite, oblong or linear, sessile, entire, punctate. Heads small, ternate or aggregated at the summit of the branchlets, usually corymbose-fastigiate. Flowers yellow.

1. *G. corymbosum* (DC.): shrubby; branchlets somewhat angled, dichotomous-corymbose; leaves alternate, oblong [or linear-lanceolate], tapering to each end, somewhat viscid, 3-nerved, the lateral nerves slender; heads aggregated three together at the summit of the branchlets, 8-flowered; the ray-flowers 5, those of the disk about 3. *DC.! prodr.* 5. *p.* 312.

Texas, *Dr. Riddell!*—Ligules not half the length of the tube. Achenia minutely puberulent.—De Candolle describes the leaves as oblong, but mentions at the same time their length as 12 to 15 lines, and their breadth 2 lines!

Subdiv. 2. ACHYRIDEÆ, *DC.*—Pappus composed of several persistent chaffy scales, or short and coroniform, sometimes nearly obsolete in the ray.

36. AMPHIACHYRIS. *DC.*, (§ of Brachyris) *notic.* 7. *pl. rar. Genev. p.* 1, *t.* 1, & *prodr.* 5. *p.* 313; *Nutt. in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 313.

Heads many-(20–40-) flowered; the ray-flowers (8–10) ligulate, pistillate, fertile, in a single series; those of the disk staminate and pistillate, but by the abortion of the ovary infertile. Involucre obovoid, shining as if varnished; the scales 10–12, rigid, appressed, imbricated, often bracteolate at the base, coriaceous, the summit abruptly somewhat foliaceous, mostly obtuse. Receptacle alveolate. Corolla of the ray oblong, with a very short tube; of the disk much smaller, infundibuliform, 5-toothed. Branches of the style (in the disk-flowers) oblong-linear, rather acute, papillose-hispid quite to the base. Achenia of the ray oblong or obconic, somewhat terete, with a minute coroniform or nearly obsolete pappus; of the disk none or a mere rudiment; the pappus of 5–8 scarious very narrowly linear scales, slightly dilated towards the summit, about the length of the corolla, united at the base into a campanulate tube.—A perennial (or possibly sometimes annual) herb, or suffrutescent glabrous plant, fastigiately much branched (in the manner of Solidago § Euthamia, with the involucre much as in Sericocarpus); with lanceolate or narrowly linear and entire sessile (1–3-nerved) impressed-punctate leaves, the margins scabrous. Heads terminating the numerous branchlets. Flowers deep yellow.

A. dracunculoides (DC.! l. c.)—*Nutt.! in trans. Amer. phil. soc. l. c.* Brachyris ramosissima, *Hook.! ic. pl. t.* 142; *DC. prodr.* 7. *p.* 278.

Western Arkansas, *Nuttall! Pourtales!* Texas, *Drummond!* Sept.-Oct.—Stem 1–3 feet high; the branchlets angled. Leaves 1–2 inches long; the lower often 3–4 lines wide; or all narrow and only 1–2 lines in width (var. angustissima, *DC.*); the lower obscurely 3-nerved. Peduncles more or less bracteolate. Achenia clothed with a very minute appressed pubescence.—We have not observed so manifest a pappus in the ray as is represented in Hooker's figure; nor do we find more than the slightest rudiment of an ovary in the disk-flowers.

37. GUTIERREZIA. *Lagasca, nov. gen. & spec.* (1816) *p.* 30; *Don, and Hook. & Arn. in compan. to bot. mag.* 2. *p.* 51.

Brachyris, *Nutt.* (1818)—Brachyris § 1. (excl. no. 6.) & Hemiachyris, *DC.*

Heads 8–40-flowered; the ray-flowers ligulate, pistillate, fertile, in a single series; those of the disk tubular, perfect and fertile. Involucre campanulate or turbinate; the scales appressed and closely imbricated, rigid, with somewhat foliaceous greenish tips. Receptacle naked. Corolla of the ray oblong or oval, with a short tube; of the disk infundibuliform, 5-toothed; the teeth short, recurved. Branches of the style in the disk-flowers linear, elongated, obtuse, hairy down to the very short stigmatic lines at the base; in the ray glabrous, the stigmatic lines extending to the summit. Achenia somewhat obconic and terete, pubescent or silky. Pappus of several linear or oblong chaffy scales, mostly in a double series, persistent; that of the ray sometimes obsolete or wanting.—Perennial or suffruticose plants (natives of the region beyond the Mississippi, and of Mexico and South America to the extremity of the continent), glabrous, somewhat glutinous and balsamic, with linear or lanceolate entire mostly impressed-punctate alternate leaves. Heads solitary, or aggregated (about 3 together) at the summit of the corymbose or paniculate branchlets. Flowers yellow.

§ 1. *Pappus as long as the achenium, more or less distinctly in a double series; that of the ray similar to the disk, or often shorter.*—GUTIERREZIA, **Lag.** **(Brachyris, *Nutt.*)**

1. *G. Californica:* stem terete, somewhat paniculate at the summit; leaves linear, acute, attenuate at the base, scabrous, slightly ciliate, strongly 1-nerved; heads few, sometimes glomerate, turbinate or obovate; flowers of the disk and ray each 8–10; pappus of mostly 9 narrowly linear rather acute chaffy scales, in the disk longer than the achenium.—Brachyris Californica, *DC.! prodr.* 5. *p.* 313; *Hook. & Arn.! bot. Beechey, suppl. p.* 351.

California, *Douglas!*—Stem a foot high. Limb of the ligulate corolla broadly oval. Achenia silky. Pappus manifestly in a double series; that of the ray shorter.—Hooker & Arnott consider this species not only identical with the following, but also probably the same as G. linearifolia, *Lag.* In G. Euthamiæ, however, the scales of the pappus are shorter and broader, the achenia less hairy, &c.; yet all these species are too closely allied.

2. *G. Euthamiæ:* stems woody and much branched at the base, angled; leaves crowded, narrowly linear, acute, attenuate at the base, 1-nerved, slightly scabrous; corymb compound, fastigiate, contracted; the heads mostly glomerate, turbinate-cylindrical; flowers of the ray and disk each about 5; pappus mostly of 9 oblong-linear obtuse chaffy scales, about the length of the achenium.—Brachyris Euthamiæ, *Nutt.! gen.* 2. *p.* 163; *Hook.! fl. Bor.-Am.* 2. *p.* 23; *DC. l. c.* Brachyachyris Euthamiæ, *Spreng. syst.* 3. *p.* 574. Solidago Sarothræ, *Pursh, fl.* 2. *p.* 540.

Arid hills of the Upper Missouri, &c., *Lewis, Nuttall!* to the Saskatchawan, *Drummond! Douglas!*—Stems numerous, 6–12 inches high. Ligulate flowers spreading; the limb broadly oval. Pappus in a double series; that of the ray mostly a little shorter, but otherwise similar.

3. *G. divaricata:* suffruticose; stems much branched above, divaricate-corymbose; leaves very narrowly linear; the oblong-turbinate heads nearly all solitary and pedunculate; flowers of the ray and disk each about 7; pappus of 9 or 10 narrowly linear acutish chaffy scales, those of the disk longer than the achenium.—Brachyris divaricata, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 313.

On the Platte near the Rocky Mountains, with the preceding, *Nuttall!*—Plant with the habit of the following, and nearly the achenia and pappus of G. Californica.

§ 2. *Pappus of the disk short and nearly coroniform, of the ray obsolete or none.*—HEMIACHYRIS, DC.

4. *G. Texana:* stem shrubby at the base, very much branched, fastigiate-paniculate; the branches slender, angled; leaves narrowly linear, 1-nerved; those of the branchlets very short; heads (small) solitary, turbinate; flowers of the ray 5–7, of the disk 7–10; pappus of the ray none or obsolete; of the disk consisting of several very small ovate chaffy scales.—Hemiachyris Texana, *DC.! prodr.* 5. *p.* 314. Brachyris n. sp. *Nutt.; Torr.! in ann. lyc. New York.* B. microcephala, *Hook.! ic. pl. t.* 147, not of *DC.*

Prairies of Arkansas, *Nuttall, Dr. James! Dr. Leavenworth!* Texas, *Drummond! Berlandier! Dr. Leavenworth! Dr. Riddell!* Aug.–Sept.—Stems 1–3 feet high; the branchlets, heads, &c., somewhat varnished. Scales of the involucre lanceolate-oblong, with scarious margins. Corolla of the ray oblong. Style as in the preceding species. Achenia minutely pubescent.

Subdiv. 3. SOLIDAGINEÆ, *DC.*—Rays in a single series, or often none. Pappus similar in the disk and ray, simple, of capillary or setiform, rarely squamellate or awn-like bristles.

38. BRACHYCHÆTA.

Heads 8–10-flowered; the ray-flowers ligulate, pistillate, fertile; those of the disk tubular, perfect and fertile. Involucre cylindrical; the scales (about 12) imbricated, appressed; the outermost short, the others oblong-linear, with somewhat greenish but scarcely herbaceous tips. Receptacle narrow, naked. Ray-flowers 4–5; the tube of the corolla as long as the oval ligule: corolla of the disk dilated above, 5-cleft; the lobes lanceolate. Branches of the style (in the disk-flowers) acute, produced above the short and flat stigmatic portion, into a deltoid-lanceolate minutely hispid acumination. Achenia somewhat obconic. Pappus of the disk and ray similar, consisting of about 20 scabrous squamellate bristles, in a single series, shorter than the achenia.—A perennial herb, with the habit of Solidago; the stem simple or sparingly paniculate at the summit. Leaves alternate, membranaceous, very veiny, ovate, acute, all but the upper somewhat cordate, on margined petioles, sharply serrate; the radical roundish. Heads small, racemose-glomerate, nearly sessile; the clusters, or near the summit the solitary heads, disposed in an elongated and interrupted somewhat leafless unilateral raceme or spike. Flowers golden yellow.

B. cordata.—Solidago sphacelata, *Raf.! ann. nat.* (1820.) *p.* 14. *no.* 106. S. cordata, *Short! suppl. cat. Kentucky plants.* Brachyris ovatifolia, *DC.! prodr.* 5. *p.* 313.

Wooded hill-sides of Kentucky, *Rafinesque! Dr. Short!* &c. to the mountains of North Carolina, as far east as Wilkes County, *Mr. Curtis!* and of Georgia, *Mr. Buckley!* Aug.-Oct.—Stem 2–4 feet high, pubescent, as well as the lower surface of the leaves, usually with a few lax and spreading or recurved branches at the summit. Radical leaves deeply cordate, 3–5 inches broad, more or less acuminate, finely veined and reticulated, somewhat triplinerved; the cauline gradually reduced in size and less cordate; the upper merely obtuse at the base; the uppermost nearly sessile and entire. Heads about 3 lines long. Rays a little longer than the disk. Achenia almost glabrous.—This plant is more closely allied to Solidago than to Gutierrezia (Brachyris); only differing from the former, indeed, in its cordate leaves and very short pappus. The latter does not consist of 5–6 paleæ, as stated by De Candolle; but of about 20 linear squamellæ, not longer than the ovary, which, if prolonged to the length of the corolla, would form bristles scarcely stronger than those of Solidago.

39. SOLIDAGO. *Linn.; Gærtn. fr. t.* 170; *Schkuhr, handb. t.* 246; *DC.*

Solidago, Euthamia, & Chrysoma, *Nutt.*

Heads few–many-flowered; the ray-flowers few (1–16), or sometimes wanting; those of the disk tubular, perfect. Scales of the oblong involucre imbricated, appressed, destitute (except in Chrysastrum) of foliaceous or herbaceous tips. Receptacle narrow, mostly alveolate. Appendages of the style lanceolate. Achenia many-ribbed, somewhat terete. Pappus simple, of numerous scabrous capillary (mostly equal) bristles.—Perennial herbs, rarely suffruticose (the greater portion North American), mostly with strict or virgate stems, and sessile alternate cauline leaves; the radical never cordate. Heads in terminal or axillary racemes or clusters, sometimes corymbose; the pedicels often unilateral. Flowers yellow (the rays white in S. bicolor), never turning purplish.

§ 1. *Herbaceous: scales of the (much imbricated) involucre with squarrose herbaceous tips: rays* 12–16, *or entirely wanting: the inner bristles of the unequal pappus slightly thickened at the apex!: heads in glomerate clusters or racemes disposed in a compound spike or panicle: leaves ample, veiny; the lower narrowed into petioles.*—CHRYSASTRUM.

* *Rays none: corolla of the disk deeply* 5*-cleft: inner bristles of the pappus manifestly clavellate-thickened at the apex.*

1. *S. discoidea:* stem somewhat villous, branching above; leaves mostly pubescent; the lower ovate, coarsely toothed or serrate, abruptly narrowed into a margined petiole; the upper oblong or ovate-lanceolate, acute at each end, somewhat petioled; the uppermost entire; racemes paniculate, often glomerate; scales of the canescently pubescent involucre linear-lanceolate, acute, squarrose; disk-flowers 10–15.—Aster? discoideus, *Ell.! sk.* 2. *p.* 358; *DC. prodr.* 5. *p.* 247.

Georgia, abundant in the high rich lands between the Alabama and Chatahouchie Rivers, *Elliott!* Middle Florida, *Dr. Chapman!* Louisiana,

Drummond! Sept.-Oct.—Stem 2–4 feet high, stout, clothed with a hoary villous pubescence. Leaves membranaceous, veiny, pale beneath, and more or less pubescent, or sometimes villous, especially on the veins, minutely pubescent above; the lower 2–4 inches long, with margined petioles about the same length, often 2 inches wide, mostly acute and mucronate; the upper gradually reduced in size, less serrate. Racemes erect, disposed in a virgate panicle. Heads smaller than in the succeeding species, often somewhat clustered. Scales of the involucre pale below, with conspicuous squarrose herbaceous tips. Achenia narrow, glabrous or nearly so; in the specimen from Dr. Chapman, pubescent when young. Pappus copious, sometimes turning purplish, unequal; the longer bristles manifestly clavellate-thickened at the apex! In Mr. Elliott's specimens of this interesting plant, the pappus is purplish, but the corolla appears to be yellow (not 'pale purple'), as it certainly is in the other specimens we have met with. That of Dr. Chapman belongs to a large plant, apparently 5 feet high, with an open panicle, and the heads are nearly as large as in S. squarrosa: the achenia also are evidently pubescent, while they are very obscurely so in Elliott's plant. The specimen of Drummond (marked 'No. 328, A, Louisiana,' in *herb. Hook.*) has smaller heads and almost glabrous leaves. In none of them do we find any trace of ray-flowers.

* * *Rays* 12–16: *pappus unequal, a portion of the longer bristles obscurely thickened at the apex.*

2. *S. squarrosa* (Muhl.): stem glabrous below, very pubescent at the summit; leaves mostly glabrous, elliptical-lanceolate or oblong, serrate, scabrous-ciliate, acute, narrowed at the base, sessile; the lowermost broadly spatulate-oval, tapering into a margined petiole; heads (large) in short clusters or glomerate racemes disposed in a dense somewhat leafy compound spike; scales of the minutely pubescent involucre rigid, imbricated in several series, with conspicuous recurved-spreading herbaceous tips; disk-flowers 16 to 24; achenia glabrous.—*Muhl.! cat. p.* 79 (fide spec. in *herb. Collins!*); *Nutt.! gen.* 2. *p.* 161; *Beck! bot. p.* 193; *Darlingt.! fl. Cest. p.* 459; *DC. prodr.* 5. *p.* 337; not of *Nutt. in jour. acad. Philad.*, nor of *Ell.?* S. confertiflora, *Nutt.! in jour. acad. Philad.* 7. *p.* 102; *Hook.! fl. Bor.-Am.* 2. *p.* 4; not of *DC.* S. macrophylla, *Pursh, fl.* 2. *p.* 542?

Rocky banks, &c., Canada! New England States! New York! Pennsylvania! and Alleghany Mountains, *Kin, in herb. Muhl.!* Aug.–Sept.—Stem 2 to 4 feet high, stout, simple. Radical and lowest cauline leaves 3–6 inches long, 1½–3 inches wide, sharply serrate; the upper leaves gradually reduced in size, more acuminate, the uppermost entire; all glabrous, or sometimes scabrous-pubescent on the midrib and principal veins, thickish. Heads showy, about as large as in S. rigida, disposed in a rigid and thick virgate interrupted spike often a foot or more long; which is composed of sessile clusters (the lower mostly shorter, the upper longer than the reduced leaves or bracts from the axils of which they arise), or sometimes of dense racemes about 2 inches in length. Scales of the involucre oblong, rigid, with minutely lacerate-ciliate margins; the innermost more membranaceous and less squarrose. Rays bright yellow, rather large.—This is not only the plant *first published* as S. squarrosa (by Mr. Nuttall), but that *so named* originally by Muhlenberg; as is evident from the habitats New York and Pennsylvania, as well as Georgia, given in Muhlenberg's Catalogue, and from the specimen which Mr. Collins received from that author under this name. Although not ticketed, specimens of this species exist in the Muhlenbergian herbarium; but there are none of S. petiolaris, to which Mr. Nuttall has recently transferred the name. Perhaps, however, the prior name of S. macrophylla should have been adopted; but as neither this species, nor any

other with that appellation, is to be found in the Banksian herbarium (which is Pursh's sole authority for the plant), we have not presumed to discard the more appropriate name of S. squarrosa; especially since Pursh's description, though chiefly applicable, is not sufficient to decide the point.

§ 2. *Herbaceous: rays mostly fewer than the disk-flowers, rarely wanting: heads more or less pedicellate, variously disposed.*—VIRGAUREA, (Tourn.) DC.

* *Heads in axillary clusters or short racemes, and often racemose at the extremity of the stem or branches: leaves feather-veined.*—Glomerulifloræ.

† Racemes or clusters often longer than the leaves, and racemose or spicate at the summit of the stem or branches.

3. *S. bicolor* (Linn.): hairy and often cinereous; stem simple, or sometimes branched at the summit; leaves oblong or elliptical-lanceolate, acute at each end; the upper sessile and often entire; the radical and lower cauline oval or spatulate-oblong, serrate, tapering into a petiole; heads in glomerate clusters or short racemes from the axils of the upper leaves, and forming an interrupted spike, or with the spicate somewhat leafy racemes more or less prolonged and paniculate; scales of the somewhat glabrous involucre oblong, obtuse; rays 7–9, short, whitish or ochroleucous; the disk-flowers (9–14) pale yellow.—*Linn.! mant. p.* 114; *Ait.! Kew.* (*ed.* 1) 3. *p.* 216; *Michx.! fl.* 2. *p.* 116; *Pursh, fl.* 2. *p.* 537; *Ell.! sk.* 2. *p.* 382; *Bigel.! fl. Bost. ed.* 2. *p.* 306; *Hook.! fl. Bor.-Am.* 2. *p.* 3; *Darlingt.! fl. Cest. p.* 458; *DC.! prodr.* 5. *p.* 335. S. alba, *Mill. dict.* Virga-Aurea flore albo, &c. *Pluk. alm. t.* 114, *f.* 8. Aster bicolor, *Nees. synops.*; *Spreng. syst.* 3. *p.* 536.

β. concolor: flowers of the ray and disk yellow.—S. hirsuta, *Nutt.! in jour. acad. Philad.* 7. *p.* 103, *& in trans. Amer. phil. soc. l. c.*

Woodlands and borders of thickets, Canada! Saskatchawan! and Northern States! to Kentucky! and the mountains of Georgia. *β.* Kentucky, *Dr. Short!* Near Philadelphia, *Mr. Gambell!* Aug.–Sept.—Stem 1–3 feet high, often very hairy or villous towards the base, commonly simple; the compact axillary clusters of rather large heads approximate and forming an interrupted virgate spike, leafy below, naked and nearly simple at the summit; but the lower clusters frequently developed into racemes or branches 2–4 inches in length. Leaves more or less hairy on both sides; the lower 2–5 inches long; the upper gradually reduced in size, less serrate and more sessile. Scales of the involucre with greenish tips and midrib. Achenia glabrous or nearly so when mature: when young sometimes entirely glabrous, but often sparsely pubescent.—We can in no way distinguish the S. hirsuta, *Nutt.* from S. bicolor, except by the color of the rays, in which the latter differs from the rest of the genus: these, however, are not pure white in S. bicolor, but cream-color; and in some specimens, as in those from Saskatchawan mentioned by Hooker, they appear to be light yellow.

4. *S. lanata* (Hook.): villous or woolly throughout; stem branched above; lower leaves spatulate-oblong, serrate, tapering into margined petioles; the uppermost and those of the simple virgate branches oblanceolate, mostly entire; racemes spicate, nearly simple; scales of the involucre oval or oblong, obtuse, nearly glabrous; rays 6–8; achenia almost glabrous.—*Hook.! fl. Bor.-Am.* 2. *p.* 4.

Plains of the Saskatchawan near the Rocky Mountains, *Drummond!*—Stem apparently about 18 inches high, producing near the summit a few simple and loose elongated branches, terminated by rather dense racemes or

spikes about 2 inches long. Leaves membranaceous; the lowest nearly 4 inches long, including the winged petiole; the uppermost very small. Heads smaller than in S. bicolor, but otherwise very similar, about 15-flowered. Achenia minutely pubescent-scabrous under a lens.

† † Clusters or glomerate racemes mostly short and axillary.

5. *S. pubens* (M. A. Curtis! mss.): stem virgate, nearly terete, pubescent, tomentose-villous above; leaves (membranaceous) oval-lanceolate, acuminate at each end, sessile, coarsely and unequally serrate-toothed, nearly glabrous above, pubescent especially on the veins and midrib beneath; heads in small axillary clusters; the lower remote, the upper approximate and forming a continuous and contracted virgate raceme; involucre as well as the very short peduncles villous-tomentose; the scales linear, rather obtuse, unequal; rays and disk-flowers each 4–7; achenia canescent.

Charlotte, Mecklenburg County, North Carolina, *Mr. Curtis!* Aug.–Sept.—Stem slender, apparently simple and 2–3 feet high; the flowering portion often a foot long, with 7 or 8 of the lower roundish clusters much shorter than the leaves; the others similar but crowded (the subtending leaves reduced to bracts), forming a continuous spicate raceme 3–5 inches long. Leaves 3–5 inches in length, an inch or more in breadth, the upper surface sprinkled with minute appressed hairs; the upper successively reduced in size, less pointed but more tapering to the base, less serrate, more hairy above and pubescent beneath. Heads about as large as in S. cæsia; the rays rather small.

6. *S. Buckleyi:* stem and lower surface of the oblong (acute at each end) subsessile leaves villous-pubescent; heads in small (loose) axillary clusters much shorter than the leaves; peduncles villous; scales of the involucre nearly glabrous, rather acute; the exterior ovate-lanceolate, short; the innermost linear; rays 4–6, the disk-flowers 9–12; achenia short and broad, (compressed?) glabrous.

Interior of Alabama, *Mr. S. B. Buckley!* Oct.—Stem (simple or branched?) apparently 2 feet or more in height, almost villous with soft hairs, leafy to the summit. Leaves about 3 inches long, and an inch to an inch and a half in breadth, nearly equal, membranaceous, copiously feather-veined, the veins and veinlets of the lower surface villous-pubescent, unequally and not very coarsely serrate with broad teeth, or the uppermost entire; the upper surface nearly glabrous. Heads larger than in S. latifolia; the lowermost nearly solitary on very short peduncles, the upper 5–8 together in short racemes or clusters. Involucre shorter than the disk; the outermost scales only pubescent. Rays rather small. Achenia perfectly glabrous, apparently compressed!—The only specimen we possess is somewhat imperfect.

7. *S. latifolia* (Linn.): stem angled, often flexuous, glabrous: leaves broadly ovate or oval, very strongly and sharply serrate-toothed, conspicuously acuminate at both ends, or somewhat petioled, mostly hairy on the veins beneath; heads in short axillary clusters or oblong racemes, and racemose or somewhat paniculate at the summit of the stem; peduncles pubescent; exterior scales of the glabrous involucre very short; the interior oblong-linear or slightly spatulate, obtuse; rays 3–4, large; the disk-flowers 6 or 7; achenia silky-pubescent.—*Linn.! spec.* 2. *p.* 879; *Smith, in Rees, cycl. no.* 49; *Muhl.! cat. p.* 79; *Torr.! compend. p.* 304. S. flexicaulis, (*Linn. spec.*, ex syn. *Pluk. & Herm.*, not of *herb.*) *Ait.! Kew.* (*ed.* 1) 3. *p.* 217; *Michx.! fl.* 2. *p.* 118 (*a.*); *Ell.! sk.* 2. *p.* 386; *DC.! prodr.* 5. *p.* 335. S. flexicaulis *β.* latifolia, *Willd. spec.* 3. *p.* 2064; *Pursh, fl.* 2. *p.* 542; *Hook.! fl. Bor.-Am.* 2. *p.* 5; *Darlingt.! fl. Cest. p.* 460. S. macrophylla, *Bigel. fl. Bost. ed.* 2. *p.* 305. Virga-Aurea Canadensis, &c. *Herm. parad.*

Bat. t. 244 (poor). V. montana Scrophulariæfolio, *Pluk. alm. t.* 235, *f.* 3. V. latissimo folio Canadensis glabra, *Pluk. l. c. f.* 4? (Varies, with the glomerate racemes, which usually do not exceed the margined petiole or attenuate base of the leaves, sometimes prolonged and exceeding the leaves, either simple or branched, or paniculate. S. flexicaulis, var. 2. *Michx.* S. flexicaulis β. ? ciliata, *DC.! l. c.*)

Moist woods and shady banks of small streams, Canada! and Northern States! to Kentucky! and the mountains and upper country of Georgia. Aug.–Oct.—Stem usually simple, 1–3 feet high, very commonly flexuous, angled by 2 or 3 decurrent lines from the base of the leaves, often hairy or pubescent at the summit. Leaves membranaceous, 3–5 or 6 inches long, and 1½ to 3 or 4 inches wide (the upper smaller and narrower, the uppermost much reduced in size), abruptly narrowed (the lowermost sometimes almost cordate) at the base into a winged petiole, fully as long as the acuminate apex of the leaf, closely, unequally, and very sharply serrate-toothed, or almost laciniate-toothed, the teeth triangular-lanceolate and spreading, often ciliate; the upper surface glabrous, or scabrous with short scattered hairs. Heads middle-sized; the clusters or racemes mostly sessile.—It must be admitted that the broader-leaved forms of S. cæsia sometimes too closely approach this species, yet we cannot but consider them as distinct. The very broad abruptly petioled leaves, with closely set and spreading teeth, and the angular stem, obviously distinguish the S. latifolia; which is one of the most common species throughout the Northern States.

8. *S. cæsia* (Linn.): stem terete, simple or branching, seldom flexuous, glabrous, mostly glaucous; leaves lanceolate or oblong-lanceolate, glabrous, serrate, acuminate, sessile; heads in short axillary clusters, and sometimes racemose-paniculate at the summit; peduncles pubescent; exterior scales of the nearly glabrous involucre oblong, short; the interior oblong-linear, obtuse; rays 3–4; the disk-flowers 5–7; achenia pubescent.—*Linn. spec.* 2. *p.* 879; *Ait.! Kew.* (*ed.* 1) 3. *p.* 217; *Pursh, fl.* 2. *p.* 540; *Smith, in Rees, cycl. no.* 37; *Ell.! sk.* 2. *p.* 385; *Bigel.! fl. Bost. ed.* 2. *p.* 306; *Darlingt.! fl. Cest. p.* 460; *DC.! prodr.* 5. 336. S. flexicaulis, *Linn.! herb.* (& *spec. l. c.?* excl. syn.); *Smith, l. c.*; not of *Ait.*, *DC.* &c. S. flexicaulis, var. 3, *Michx.! fl.* 2. *p.* 118. S. axillaris, *Pursh! fl.* 2. *p.* 542; *Beck, bot. p.* 193; *DC. prodr.* 5. *p.* 335. S. livida, *Willd. enum. p.* 890; *Pursh, fl.* 2. *p.* 541. Virga-Aurea Marilandica cæsia glabra, *Dill. Elth. t.* 307, *f.* 395.—(Varies, with the stem simple, or considerably branched; the heads in small globular clusters, or in more or less prolonged racemes at the summit of the stem or branches; the leaves vary from oblong-lanceolate to elongated linear-lanceolate, &c.)

Woodlands and thickets, Canada! to Georgia! and Louisiana! Aug.–Oct.—Stem 1–3 feet high, slender, often purplish, and of a glaucous hue. Leaves 2–5 or even 6 inches long, one-third or half an inch to an inch and a half wide, smooth, except the scabrous margins, mostly narrowed at the base, but sessile, irregularly and sharply serrate, with the teeth either appressed, or often coarse and somewhat spreading; the uppermost usually entire; the radical and lowermost ovate or oblong and tapering into a slight petiole. Heads nearly as large as in S. latifolia; the bright yellow rays very similar, the achenia pubescent, but not silky or canescent.—There is no specimen of S. cæsia in the Linnæan herbarium, and that species appears to have been founded on the figure of Dillenius. Although the specimen of S. flexicaulis in the herbarium of Linnæus certainly belongs to this species, as Smith has long since remarked, yet we are unwilling to employ that name: 1st, because the stem is very seldom flexuous; 2nd, because most succeeding authors have applied it to S. latifolia, while the equally ancient name of S. cæsia has not been misapplied; and 3rd, because the specific phrase given by Linnæus, and the entire synonymy, belong to S. latifolia. Those authors,

however, who unite the two species very properly adopt the name of S. flexicaulis.

9. *S. Curtisii:* stem tall, very strict and simple, striate-angled, nearly glabrous; leaves elongated-lanceolate, smooth and mostly glabrous, finely and sharply serrate above the middle, gradually tapering to the base, sessile, sharply acuminate; heads in dense and sessile axillary clusters, all many times shorter than the leaves; involucre minutely pubescent; the exterior scales short (few), the others linear, rather obtuse; rays and disk-flowers each 4–6; achenia minutely pubescent.

β.? monticola: leaves sparingly appressed-serrate; the upper scarcely longer than the subsessile glomerate clusters, the uppermost reduced to bracts; scales of the about 15-flowered involucre narrowly-linear, acute; achenia glabrous.

Mountains of North Carolina (*β.* Yellow Mountain), *Mr. M. A. Curtis!* &c. Aug.–Sept.—Stem virgate, 3–5 feet high, rather stout, leafy to the summit (where it is somewhat pubescent), grooved and striate-angled, not glaucous. Leaves rather equal throughout, membranaceous, 5–6 inches long, half an inch to an inch wide, irregularly and sharply serrate, gradually (the upper slightly, the lower ones conspicuously) tapering to the sessile base. Peduncles and pedicels very short, pubescent. Heads as large as in S. cæsia; the scales of the involucre narrower, &c.—We have only an imperfect specimen of var. *β.?* which appears to be a smaller plant, with shorter leaves; the glomerate clusters approximate, and near the summit forming a strict interrupted spike; the heads rather smaller, but the flowers more numerous.

10. *S. ambigua* (Ait.): stem somewhat flexuous, glabrous, angled, branching; leaves oblong-lanceolate, densely serrate, slightly hairy beneath; racemes erect; rays elongated [scales of the involucre lanceolate, acute; achenia canescently hairy]. *Ait.! Kew.* (*ed.* 1) 3. *p.* 217; *Smith, in Rees, cycl.; DC. prodr.* 5. *p.* 336*?* (The additions to the character derived from the specimen in *herb. Banks.*)

β.? lancifolia: leaves elongated lanceolate, attenuate-acuminate; racemes pedunculate, somewhat compound or paniculate, numerous, all but the lowermost longer than the leaves, forming an elongated panicle; rays rather small.

North America? described from specimens of unknown origin, cultivated in 1759 by Miller, and in the Kew Garden. Smith supposes that it may be a variety of S. latifolia; "from which it differs in its somewhat narrower leaves, and much greater length-of the upper clusters of flowers, which combine to form a close panicle." The figure he cites from Plukenet doubtless belongs to S. latifolia; and the plant cultivated as S. ambigua in the Berlin Garden, and some others, is probably nothing but a state of that species. But the original plant must be different, as the scales of the (perhaps 20-flowered) involucre are lanceolate or linear-lanceolate, acute, and more imbricated. If really of American origin, the plant we have doubtfully subjoined is probably not specifically distinct from it.—The latter was collected on the Yellow Mountain in North Carolina by *Mr. M. A. Curtis.* The angular stem is apparently simple and 3 feet in length (the base is wanting in the specimen); the flower-bearing portion a foot long, somewhat pubescent. The leaves, instead of elliptical-lanceolate and abruptly narrowed into a short winged petiole, as in the original S. ambigua (like a narrow-leaved var. of S. latifolia), are elongated lanceolate, tapering gradually from near the middle to the base, 4 to 5 inches long, less than an inch in width, thin, smooth and glabrous, or with a few scattered hairs, sharply and rather finely serrate, except the slender acuminate apex and near the base. Racemes 20 or more, approximate, erect or somewhat spreading, more or less compound, naked at

the base (pedunculate); the lower about 3 inches in length but rather shorter than the subtending leaves; the upper successively shorter, but longer than the reduced narrowly lanceolate and nearly entire leaves: heads usually crowded on the branches of the raceme, on short pedicels, or nearly sessile. Scales of the involucre glabrous or minutely granular, similar to the original S. ambigua, or perhaps a little broader. Achenia canescently hairy.—If we mistake not, this is by no means an uncommon species in the mountains of North Carolina, but we have only seen the living plant before the flowering season.

* * *Racemes terminal, erect, not secund, either simple and virgate, or compound and paniculate: leaves feather-veined.*—Virgatæ.

11. *S. virgata* (Michx.): glabrous throughout; stem virgate, simple, very slender; leaves somewhat fleshy, entire, with scabrous margins; the radical and lowest cauline oblong-spatulate or oblanceolate, often obscurely serrate, petioled; the others small, appressed, lanceolate-oblong, sessile; those of the attenuated upper part of the stem very small and bract-like; heads (middle-sized) numerous, in a very strict or spiciform compound raceme; scales of the involucre linear-lanceolate, glabrous; rays 5–7, elongated; achenia pubescent.—*Michx.! fl.* 2. *p.* 117; *Pursh, fl.* 2. *p.* 538; *Nutt.! gen.* 2. *p.* 160; *Ell.! sk.* 2. *p.* 384; *DC. prodr.* 5. *p.* 338.

Pine barrens, mostly in damp soil, New Jersey! to Florida! and Alabama! Sept.-Oct.—(June to Oct., *Ell.*)—Stem 2–4 feet high, very strict and simple, leafy throughout, but the leaves of the upper part of the stem reduced to mere bracts (one-half to one-fourth of an inch in length), terminated by a virgate compact raceme, 3–12 inches long, which is composed of short approximate racemes, bearing 3–6 heads; the short peduncles and slender pedicels appressed, glabrous, furnished with subulate bracts. The general raceme is often more or less secund; and occasionally the inflorescence is more compound and paniculate. Heads about 16-flowered. Exterior scales of the involucre short and often subulate; the inner rather acute. Radical leaves 5–8 inches long, including the margined petiole, 6–12 lines wide, obscurely serrulate, or not unfrequently quite entire.

12. *S. pulverulenta* (Nutt.): minutely and softly puberulent; stem simple, virgate, very leafy; cauline leaves short, obovate-oblong, obscurely veined, mostly entire, often mucronate-acute, attenuate at the base, sessile; the radical and lowermost oblong or spatulate, serrate, tapering into a petiole; heads numerous, crowded on the short peduncles, and disposed in a long and strict compound raceme; scales of the involucre narrowly lanceolate, acute, appressed; rays about 10, elongated; achenia glabrous.—*Nutt.! gen.* 2. *p.* 161; *Ell. sk.* 2. *p.* 384; *DC. prodr.* 5. *p.* 338.

β. peduncles somewhat elongated, and often spreading, forming an expanded compound raceme.

Georgia and Florida, *Baldwin.* Alabama, *Dr. Gates!* North Carolina, *Mr. Curtis!* Sept.—Stem 2–3 feet high, very strict and simple, terminating in a narrow and somewhat spicate raceme (rarely more expanded and compound), 8–16 inches in length. Radical and lowest cauline leaves similar to those of S. puberula; the others gradually diminishing from an inch and a half to half an inch in length, and from 6 to 3 lines in breadth, obovate or oblong; the lower often serrate. Heads as large as in S. puberula, but fewer-(20–25)-flowered: the puberulent involucre nearly similar, but the scales rather broader.—Distinguished from the too closely allied S. puberula by the more manifest cinereous pubescence, the short and broad cauline leaves, and the contracted virgate inflorescence; but in some specimens (var. *β.*) the lower peduncles are prolonged into racemes of considerable length.

13. *S. puberula* (Nutt.): very minutely puberulent; stem simple; cauline leaves lanceolate, acute, tapering to the base, sessile, mostly entire; the lower oblanceolate and somewhat serrate; the lowest and radical oblong-spatulate, serrate towards the apex, petioled; heads (middle-sized) in numerous compact erect-spreading racemes (often compound), forming an elongated or sometimes thyrsiform panicle; scales of the involucre linear-subulate, appressed; rays about 10, elongated; achenia nearly glabrous.—*Nutt.! gen.* 2. *p.* 162: *Darlingt.! fl. Cest. p.* 459; *DC.! prodr.* 5. *p.* 333. S. pubescens, *Ell.! sk.* 2. *p.* 381; *DC. l. c.*

Sandy woods &c. mostly in damp soil, Maine (*Mr. Oakes!*) and Massachusetts! New Jersey! &c. to Georgia! Aug.–Oct.—Stem 2–4 feet high, strict, often purplish. Leaves thin, soft to the touch from the minute pubescence, which is scarcely visible to the naked eye, somewhat veiny; the radical ones 3–6 inches long, including the slender winged petioles, obtuse; the lower cauline 2–3 inches long and 6–8 lines wide, gradually diminishing upwards. Racemes very numerous, either short and disposed in a long and dense virgate compound raceme, or narrow panicle; or with the lower racemes elongated, and either simple or compound, forming a more expanded panicle. Heads about 28-flowered: rays golden yellow. Achenia very minutely pubescent under a lens, glabrous or nearly so when mature.

14. *S. confertiflora* (DC.): herbaceous, glabrous, viscous; stem simple, leafy to the thyrsus; leaves oval-lanceolate or oblong-lanceolate, serrate at the apex, entire below, tapering (particularly of the lower ones) into long petioles; heads 8–14-flowered, very much crowded in a spiciform thyrsus; scales of the involucre linear, erect; rays few and small.—*DC.! prodr.* 5. *p.* 339, not of *Nutt.* S. glutinosa, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 328. S. compacta, *Turcz. in bull. soc. nat. Mosc.* 1840, *p.* 73?

Nootka and Mulgrave Sound, *Hænke* ex *DC.* Plains of the Oregon and Wahlamet, *Nuttall!*—"About 2 feet high, with a brown stem, angular above; lower leaves 3 or 4 inches long, by about half an inch wide; the radical attenuated into long petioles. Upper part of the stem, bracts, and involucrum indued with an orange varnish-like resin, of a strong, aromatic, and rather unpleasant taste. Rays about 8–10 [we observe 5–8]: discal florets 5 or 6: pappus of the rays a little shorter," *Nutt.*—Not having compared the two, we are not certain that the S. glutinosa, *Nutt.* is the S. confertiflora, *DC.*; but we find no essential difference. In the former, the radical leaves are lanceolate-spatulate, 3–4 inches long, sharply serrate near the apex, with a long attenuate entire base, veiny and somewhat triplinerved: the cauline 2–3 inches long, 3–4 lines wide, rather obscurely reticulate-veined, the lower more attenuate at the base. Heads middle-sized, in short glomerate racemes which are aggregated in a spiciform panicle. Exterior scales of the involucre ovate or roundish, very short; the middle ones ovate-oblong, the innermost linear-oblong. Rays small. Achenia minutely pubescent.

15. *S. spiciformis:* glabrous or nearly so; stem ascending, simple (somewhat glutinous?); leaves obovate-spatulate, finely serrate, tapering into a narrow entire base, or the lower into long margined petioles, reticulate-veined; racemes short, crowded in a dense spike or thyrsus: scales of the involucre oblong, very obtuse, appressed, nearly glabrous; rays about 7, very small; achenia silky-pubescent.—S. petiolaris, (*Less. in Linnæa, l. c.?*) *Hook. & Arn. bot. Beechey, p.* 145, chiefly; not of *Ait.*

Monterey, California, *Capt. Beechey!* (v. sp. in *herb. Hook.*)—Stem stout, 8–12 inches high; the base decumbent and apparently somewhat persistent, densely clothed with spatulate leaves, which taper into slender petioles: above with more scattered and less petioled leaves; those near the summit small and sessile. The leaves are all glabrous or nearly so, usually serrate with close and fine acute teeth, except the narrowed base, mostly obtuse, and

manifestly reticulate-veined beneath. Heads middle-sized or rather large, crowded on the short erect racemes, and disposed in a dense spike or thyrsus 3–5 inches in length, about 25-flowered. Rays short and inconspicuous.

16. *S. Californica* (Nutt.): villous and cinereous: leaves nearly all equal and somewhat crowded, oblong-lanceolate, acute at each end, near the apex sometimes very slightly serrulate; panicle elongated, nearly equal; scales of the involucre lanceolate, acute, somewhat pubescent; rays about 9; achenia pubescent. *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 238. S. petiolaris, *Less. in Linnæa*, 6. *p.* 502?

β. softly cinereous-pubescent: leaves oblong, mostly obtuse, attenuate at the base, veiny; heads somewhat secund?—S. petiolaris, *Hook. & Arn.! bot. Beechey, p.* 145, partly. S. puberula, *Cham. & Schlecht. l. c.?*

St. Barbara, California, *Nuttall.* *β.* Monterey, California, *Capt. Beechey!*—"Two or 3 feet high. Discal flowers about 9, as well as the rays. Allied to the preceding [S. nana]; but softly villous and acute-leaved: the stem-leaves are also nearly as large as the radical ones, about an inch or an inch and a half long, by less than half an inch wide." *Nutt.*—In the only specimen of var. *β.*, the lower part of the stem is wanting: the leaves are much like those of S. ovalifolia; the lower 1–2 inches long, considerably attenuate at the base, the upper successively smaller, some of them obscurely serrate towards the apex. The heads are not much larger than in S. nemoralis, 14–16-flowered, crowded; the rays small, about 7. Scales of the involucre lanceolate, acutish, slightly pubescent. The terminal portion of the panicle or compound raceme appears to have been somewhat curved and unilateral.

17. *S. petiolaris* (Ait.): stem simple and virgate, often branching above, leafy, covered with a close pubescence, nearly tomentose at the summit; leaves oval or elliptical, mucronulate, veiny, somewhat scabrous above and puberulent-tomentose beneath (at least the midrib and veins), scabrous-ciliolate; the upper mostly entire, abruptly and slightly petioled; the lower often serrate, narrowed at the base: heads (rather large) in a single virgate raceme or several paniculate racemes; scales of the pubescent involucre lanceolate; the exterior loose or spreading, somewhat herbaceous; rays about 10, elongated; achenia at length glabrous.—*Ait.! Kew.* (*ed.* 1) 3. *p.* 216; *Smith! in Rees, cycl.*; not of *Muhl.*, *Ell.*, nor of *Less.* S. erecta! *Nutt.! gen.* 2. *p.* 161; perhaps also of *Pursh, fl.* 2. *p.* 542. S. elata! *Ell.! sk.* 2. *p.* 389, not of *Pursh.*

β. squarrulosa: exterior scales of the involucre linear or subulate, more herbaceous, somewhat squarrose.—S. squarrosa, *Nutt.! in jour. acad. Philad.* 7. *p.* 102; not of *Nutt. gen.*, nor of *Muhl.*, or *Ell.?*

Pine barrens and sandy, usually dry soil, North Carolina! to Georgia! Florida! and Western Louisiana! Aug.–Sept.—Stem 1–2, rarely 3 feet high, clothed with a fine and short somewhat hoary pubescence, which at the summit and on the peduncles, &c. is tomentose. Leaves pale, almost glabrous or slightly scabrous above, prominently feather-veined beneath, and often somewhat reticulated, either obtuse or acute, 1–2 inches long, gradually diminishing in size upwards; the lower more or less narrowed at the base, but very slightly petioled, usually serrate with small scattered teeth; the upper rounded at the base, slightly petioled, it may be, but appearing sessile. Raceme usually virgate, terminating the stem or branches; or often several disposed in a panicle, rarely nearly simple; the heads usually 2–5 on each short peduncle, and on mostly slender bracteolate pedicels, pretty large, 20–25-flowered. Rays bright yellow. Achenia minutely pubescent when young, glabrous when mature. Inner scales of the involucre with somewhat greenish tips, appressed; the exterior short and loose, gradually passing into the subulate bracts of the pedicels: in var. *β.* these bracts are more

numerous, and the attenuated and longer exterior involucral scales exactly resemble them, giving the involucre a squarrose appearance. The extreme forms would seem to belong to different species (although no other difference is observable); but a full suite of specimens furnishes every gradation between them.—No species could less deserve the name of S. petiolaris than this, at least in its ordinary forms: if the leaves may be said to be petioled, they are so slightly so, that we believe no author has identified the plant by the character; but, as this is certainly the plant described in the Hortus Kewensis, as well as by Smith, we do not feel at liberty to reject it. —For his S. erecta, Pursh cites *Herb. Banks. mss.*; but there are no specimens with this name in the Banksian herbarium: he not improbably had the present species in view, to which his short character is not inapplicable. —The S. petiolaris of the Berlin Garden, 1839 (and of *Link. enum.?*) is S. Virga-Aurea. The S. petiolaris, *Thuillier*, of the Paris and some other gardens, is S. Narbonensis, *Pourr.* (Vide *S. elata.*)

18. *S. angusta:* stem strict and simple, leafy, slightly scabrous; leaves lanceolate, mucronate-acute, tapering to the base, sessile, sparsely veined, with a prominent midrib, glabrous, with ciliate-scabrous margins; the lowermost obscurely serrate towards the apex; the others entire; heads (rather large) in a contracted raceme; scales of the almost glabrous involucre lanceolate; the outermost subulate, loose, or at length squarrose-spreading, somewhat herbaceous; rays about 10, elongated; achenia glabrous.

Alexandria, Western Louisiana, *Dr. Hale!* Arkansas near the Hot Springs, *Dr. Engelmann!* Sept.—Stem 3–4 feet high, virgate, very leafy throughout, glabrous below, scabrous-puberulent towards the summit. Leaves bright green above, pale beneath, oblanceolate, ciliate with minute and close uncinate hairs; the midrib and the few veins rather prominent on the lower surface; the lower 3 inches or more in length, and nearly three-fourths of an inch in width; the upper gradually diminishing in size, and less veiny. Heads resembling those of S. petiolaris, 2 to 4 upon the short peduncles, which are disposed in a narrow somewhat crowded raceme 4–6 inches long, 25–30-flowered. Involucre and pedicels apparently slightly viscid. Rays conspicuous, deep yellow. Achenia and ovaries perfectly glabrous.

19. *S. stricta* (Ait.): smooth and glabrous throughout; stem strict and very simple; leaves lanceolate, acute; the radical and lower cauline sparingly appressed-serrate, tapering into winged somewhat sheathing petioles; the upper sessile, entire; racemes (simple or compound) appressed, numerous, forming a crowded and very strict virgate panicle, which is usually leafy towards the base; heads (rather small) 8–12-flowered; scales of the cylindrical involucre linear-oblong, obtuse: rays 5–6, small; achenia glabrous.—*Ait.! Kew.* (*ed.* 1) 3. *p.* 216; *Willd. spec.* 3. *p.* 2062; *Pursh, fl.* 2. *p.* 540? (excl. habitat); *Richards. appx. Frankl. journ. ed.* 2. *p.* 33; *Hook.! fl. Bor.-Am.* 2. *p.* 4 (excl. Saskatchawan spec.); *DC. prodr.* 5. *p.* 340? S. uliginosa, *Nutt.! in jour. acad. Philad.* 7. *p.* 101, partly?

Sphagnous swamps, Newfoundland! Hudson's Bay! (*Herb. Banks*) &c. to Massachusetts! and the Western part of New York! July–Aug.—Stem 1–3 feet high, virgate, usually purple, perfectly smooth to the summit, even the peduncles and pedicels glabrous or very nearly so. Leaves of a firm texture, with a strong midrib, and several straight veins, the veinlets of the pale lower surface minutely reticulated: the radical (appearing in the autumn preceding flowering, and remaining through the winter) 6–10 inches long, an inch to an inch and a half wide in the middle, tapering to each end (the primordial obtuse), the base attenuate into a carinate petiole about the same length; the lower cauline similar, but with shorter sheathing petioles; the upper gradually reduced in size and breadth.—A northern species, distinguished by its smoothness, elongated-lanceolate willow-like leaves (the

popular name applied in Hortus Kewensis, "Willow-leaved Golden Rod," is appropriate); the panicle narrow and perfectly strict (6 to 18 inches long, and only 1–2 wide), entirely in fruit by the middle of September; the achenia entirely glabrous, or rarely presenting a few minute scattered hairs, under a lens.—A near approach to this species is sometimes observed in narrow-leaved states of S. neglecta, with short racemes, at first scarcely if at all spreading or secund.

20. *S. speciosa* (Nutt.): stem simple, stout, glabrous; the summit, with the peduncles and pedicels hirsute-pubescent; leaves thickish, smooth and glabrous, with densely scabrous-ciliolate margins; the lower oval or ovate, narrowed into a margined petiole, somewhat serrate, the upper lanceolate or oblong-lanceolate, entire; racemes numerous, erect, forming a pyramidal or thyrsiform (usually ample) panicle; heads (pretty large) on short pedicels, somewhat crowded or glomerate; scales of the cylindrical nearly glabrous involucre oblong, obtuse; rays about 5, large; achenia very glabrous.—*Nutt.! gen.* 2. *p.* 160 (excl. syn. *Pers.*); *Darlingt.! fl. Cest. p.* 459. S. sempervirens, *Michx.! fl.* 2. *p.* 119, not of *Linn.* S. petiolaris, *Muhl.! cat. p.* 79; *Bart. fl. Phil.* 2. *p.* 121; not of *Ait.*

β. angustata: smaller, less pubescent at the summit; racemes short and glomerate, forming a narrow and dense, interrupted or somewhat compound spike.—S. erecta? *Ell.! sk.* 2. *p.* 385; *DC. prodr.* 5. *p.* 340?

γ. rigidiuscula: heads smaller; panicle strict; peduncles and summit of the stem less pubescent; leaves nearly all entire and smaller, lanceolate or oblong, more rigid.

Borders of woods &c. (Canada, *Michaux*) Massachusetts! and Ohio! to Kentucky! and Florida! *β.* New Jersey! North Carolina! South Carolina! Kentucky! &c. *γ.* St. Louis, Missouri and Texas, *Drummond! Dr. Engelmann!* Louisiana, *Dr. Leavenworth!* Prairies between the Mississippi and Missouri Rivers, *Mr. Nicollet!* Aug.–Oct.—Stem 2½ to 5 or even 6 feet high, stout, erect, glabrous and often purple; the summit and the branches of the inflorescence pubescent, in a greater or less degree, with short and close jointed hairs, not unfrequently almost hirsute. Radical leaves 6 inches or more in length, and 2–4 wide, sharply serrate, petioled; the lower cauline ample, 4–6 inches long, 1–2, or often 3 inches wide, acute or slightly acuminate, narrowed into a slight margined petiole, thickish, very smooth except the margins, with a rather strong midrib; the primary veins seldom prominent; the veinlets very copiously and minutely reticulated; upper leaves successively much reduced in size; the primary veins obscure and similar to the immersed, inconspicuous, but finely reticulated veinlets. Panicle very showy, 6–18 inches in length, composed of numerous, rigid, dense or spicate racemes, which vary from 1 to 5 inches in length. Heads crowded, 12–16-(rarely 18-) flowered, large for the number of flowers they contain, but somewhat variable in size. Scales of the involucre 1-nerved, pale, with greenish summits, glabrous or nearly so, appressed, large; the exterior oval or oblong, short, very obtuse; the innermost linear-oblong, sometimes acutish. Rays conspicuous, deep yellow.—A very showy species, varying considerably in the size of the leaves, and in the panicle, which in some specimens is very large and compound; in others small and simple. The var. *β.* is a reduced state, growing in poor soil; its contracted inflorescence often simulating S. bicolor, for which indeed it has sometimes been mistaken. Var. *γ.*, which probably grows in more arid situations, has smaller heads as well as leaves; the latter often conspicuously veined and more rigid.

21. *S. verna* (M. A. Curtis! mss.): softly cinereous-pubescent; stem erect or ascending, loosely paniculate at the summit; the branches nearly naked; leaves scattered, veiny, minutely tomentose beneath; the radical and lower cauline ovate or oval, finely serrate, abruptly narrowed into mar-

gined petioles; the uppermost oblong or lanceolate, sessile, mostly entire; racemes loose, paniculate, or rarely somewhat corymbose, sometimes slightly recurved; scales of the nearly glabrous involucre linear-lanceolate; rays 10–12, large; achenia pubescent.

Open sandy pine woods, near Wilmington, and Lenoir County, North Carolina, *Mr. M. A. Curtis!* (Florida, *Herb. Rafinesque!*) May–June.—Stem about 2 feet high, almost villous when young. Radical and lowest cauline leaves 2–3 inches long, and often 2 inches wide, usually somewhat triple-veined, abruptly contracted into winged or margined petioles which vary in length from 1 to 5 inches; the other cauline nearly similar but only narrowed at the base and seldom petioled; the upper very few and reduced in size. Heads middle-sized, about 30-flowered, loosely racemose on the slender naked branches, the summits of which are sometimes a little spreading or recurved. Pedicels slender. Rays linear-oblong, golden yellow.

22. *S. Terræ-Novæ:* stem erect, smooth, paniculate-corymbose and somewhat pubescent at the summit; leaves glabrous; the cauline lanceolate, tapering to the base, nearly entire; the lowest and radical spatulate-oblong, tapering into a margined petiole, somewhat serrate; racemes numerous, short, loose, forming a large expanding and mostly fastigiate compound panicle; heads (small] about 12-flowered; scales of the involucre glabrous, oblong-linear; rays 5–6, small; achenia nearly glabrous.

In bogs, Newfoundland, *Pylaie! Miss Brenton!* (in *herb. Hook.*)—Plant 1–2 feet high. Leaves smooth, minutely veiny; the lowest about 3 inches long, an inch wide near the apex, mostly obtuse; the uppermost narrow, entire. Panicle open, 4–5 inches broad at the summit; the paniculate irregular racemes more or less spreading, but not secund. Heads as large as in S. stricta; the scales of the involucre membranaceous and much narrower. —The specimen from Miss Brenton consists of the panicle, with only the summit of the stem, the former so much expanded that it was referred by Hooker to S. serotina: but it appears rather to belong to the present division.

23. *S. humilis* (Herb. Banks): glabrous; stem simple, erect; radical leaves oblanceolate or spatulate, obtuse, crenate-serrate at the apex, tapering into a petiole; the cauline lanceolate, acute, narrowed at the base; the uppermost linear and entire; raceme simple, or compound and paniculate, elongated, strict; scales of the involucre oblong (somewhat glutinous,) mostly obtuse; rays 6–8, short; achenia minutely canescent.—*Pursh! fl.* 2. *p.* 543; *Richards! appx. Frankl. journ. ed.* 2. *p.* 33; *Hook.! fl. Bor.-Am.* 2. *p.* 5; not of *Desf.* & *DC.* S. confertiflora, *Fisch. & Meyer, animad. bot. in ind. sem. St. Petersb.* 1840, *ex ann. sci. nat. (n. ser.)* 16. *p.* 59.

β. stem taller; heads more numerous, in short glomerate clusters disposed in a dense, somewhat interrupted, virgate spike or compound raceme.—S. stricta, *Hook.! l. c.*, partly.

Fort Albany, Hudson's Bay, and Newfoundland, *Herb. Banks!* Woody country between lat. 54° and 64°, *Richardson!* Limestone cliffs on the banks of the Onion River &c. Vermont, *Dr. Robbins!* *β.* Carlton House on the Saskatchawan &c. *Drummond!* Aug.–Sept.—Stem 6–15 inches high, nearly or quite glabrous, but more or less glutinous, as also the leaves in the fresh plant: the raceme simple and slender, or more or less compound; the branches strict; the middle-sized heads rather crowded, in *β.* much so. Leaves of a firm texture; the radical often coarsely toothed at the apex; the cauline about 2 inches long, 3–4 lines wide, serrulate above; the upper narrower and entire.—Differs from S. Virga-Aurea in its more rigid foliage, smaller heads, with the scales of the involucre more appressed, rigid, obtuse, and appearing somewhat glutinous.

24. *S. Virga-Aurea* (Linn.): stem erect, terete; cauline leaves lanceolate, tapering to each end, serrate; the lower elliptical, petioled; raceme

erect, simple or compound; scales of the involucre linear [or lanceolate], acute; rays about 8, elongated; achenia minutely pubescent. *DC.—Linn.! spec.* 2. *p.* 880; *Engl. bot. t.* 301; *Fl. Dan. t.* 663; *Hook.! fl. Bor.-Am.* 2. *p.* 5; *DC.! prodr.* 5. *p.* 338.

β. alpina (Bigel.! l. c.): stem 3–8 inches high, simple, glabrous or pubescent, bearing few (1–8) heads; scales of the involucre lanceolate, nearly glabrous; rays short; leaves oblanceolate, oblong-obovate, or spatulate.

γ. multiradiata: stem villous-pubescent, simple, or rarely branched at the summit; heads (large) in a dense thyrsoid or corymbose raceme; scales of the involucre narrow, nearly glabrous; rays 8–12; leaves ciliate, oblong-lanceolate (obtuse or acute), tapering to the base.—S. multiradiata, *Ait.! Kew. l. c. p.* 218; *Pursh! fl.* 2. *p.* 542; *Hook.! fl. Bor.-Am.* 2. *p.* 5; *E. Meyer, pl. Labrad. p.* 64; *DC. l. c.* S. Virgaurea, *Pursh, l. c.* S. corymbosa, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 328, not of *Ell.* (Varies, with the rays fewer and smaller. S. Virga-Aurea, *Hook. & Arn.! bot. Beechey, p.* 126. S. Virga-Aurea var. Arctica, *DC.! l. c.*)

Arctic America! and Labrador! to the Rocky Mountains! (in about lat. 54°) Unalaschka! Sledge Island! and Kotzebue's Sound! (*a.* & chiefly *γ.*) *β.* On the bare summits of the White Mountains of New Hampshire! and on Mount Marcy, Essex County, New York! Shore of Lake Superior, *Dr. Pitcher! Dr. Houghton!* Aug.–Sept.—A very variable species, which in this country is confined to the Northern regions, and the higher mountains of the Northern States. Nearly all the American specimens belong either to var. *β.*, which very nearly approaches the var. Cambrica of Europe, or to the var. *γ.*, which passes insensibly into other forms of this species, to which it should doubtless be united.

25. *S. thyrsoidea* (E. Meyer): stem erect or somewhat flexuous, simple, very glabrous, the summit and peduncles villous-pubescent; leaves glabrous, ovate, irregularly and sharply serrate, acute or acuminate, veiny, all except the upper cauline abruptly narrowed into very long petioles; the uppermost oblong-lanceolate, subsessile, often pubescent beneath; raceme oblong, simple or slightly compound; heads large; the peduncles mostly ebracteate; scales of the involucre nearly equal, lanceolate, acuminate, membranaceous, nearly glabrous; rays 8–10; achenia glabrous (slightly pubescent at the summit).—*E. Meyer, pl. Labrad. p.* 63; *DC. prodr.* 7. (*mant.*) *p.* 279. S. leiocarpa, *DC.! prodr.* 5. *p.* 339. S. multiradiata, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 328, not of *Ait.!* S. Virgaurea, *a. Bigel. fl. Bost. ed.* 2. *p.* 306.

Labrador, *Herzberg* (*E. Meyer*), *Kohlmeister!* (v. sp. in *herb. Schweinitz, herb. Collins*, &c.) Lower Canada, *Michaux! herb.* On the wooded sides of the White Mountains of New Hampshire, *Dr. Boott! Mr. Oakes!* &c. Killington Peak and Mansfield Mountains, Vermont, *Dr. Robbins!* Aug.–Sept.—Allied to S. Virga-Aurea (var. alpestris); but certainly a distinct species; remarkable for the abrupt and very long petioles of all but the uppermost cauline leaves (frequently two to three inches long, supporting a lamina about half that length, and an inch or more in breadth); for its larger heads, which perhaps are only exceeded by the following; and the glabrous achenia, upon which, however, a little hairiness is observable near the summit. The raceme commonly consists of 6 to 12 heads, on short and simple bractless peduncles from the axils of the upper leaves, &c., rather crowded: but one specimen from Labrador presents a large raceme more than 6 inches long, with nearly all the peduncles somewhat elongated and bearing 2 to 4 heads; the pedicels often longer than the heads, and furnished with a linear-subulate, scarious, deciduous bracteole. Rays rather short.—The species is well described by Meyer.

26. *S. glomerata* (Michx.): stem low, very simple; leaves glabrous, am-

ple, lanceolate, serrate; raceme simple, of axillary clusters, the uppermost capitate, crowded; involucre turgid, many-flowered. *Michx. fl.* 2. *p.* 117.

Mountains of Carolina, *Michaux.*—With much hesitation we join to this species a remarkable plant which we had called *S. macrantha*, collected in flower on the Roan Mountain by Mr. Curtis, and which is also abundant towards the summit of the Grandfather, N. Carolina (*Gray, in Sill. journ.* 42. *p.* 35); flowering in August. It is one to 2 feet high, with a stout striate-angular glabrous stem; with large, broadly lanceolate or obovate-lanceolate, glabrous leaves, 4–9 inches long, the lower 2–3 broad, ciliate especially towards the tapering entire base, serrate above with small sharp teeth, acuminate, veiny, of a firm but rather thin texture; the radical tapering into a winged petiole. Heads larger than those of S. rigida, 3–7 together in short racemes or clusters in the axils of the upper leaves, at first glomerate, but when expanded the pedicels (stout and pubescent, like the peduncles) are often as long as the heads; the lowest clusters somewhat remote, the others approximate, forming a narrow (sometimes thyrsoid) elongated panicle or compound raceme, mostly simple at the summit. Scales of the involucre imbricated in 3 or 4 series, 1-nerved, acutish; the exterior oblong-ovate, the innermost linear-lanceolate, nearly glabrous. Flowers 30–40 in each head; the rays 10–12, small in proportion. Achenia pubescent towards the summit, nearly glabrous below.—We know not what plant Nuttall had in view as the S. glomerata, of which he remarks (*Gen.* 2. *p.* 161): "Lower leaves broad oval and acuminate, serrate: nearly allied to Aster." Nor have we been able to ascertain the species mentioned by Schweinitz (in *Ell. sk.* 2. *p.* 387,) as "distinguished by its deep and close serratures, and the capitate form of the axillary racemes": the latter, however, is probably S. latifolia.

* * * *Heads in a compound corymb terminating the simple stem, showy: leaves feather-veined or* 3*-nerved.*—Corymbosæ.

† Scales of the involucre acute: achenia pubescent: leaves veiny.

27. *S. spithamæa* (M. A. Curtis! mss.): stem villous-pubescent, leafy; leaves oval or oblong-lanceolate, ciliate, nearly glabrous, sharply serrate above the middle, or the uppermost entire; the lowest and radical spatulate-oblong, tapering into winged petioles; heads (middle-sized) disposed in a compound glomerate corymb; peduncles and pedicels villous; scales of the involucre somewhat equal, lanceolate, ciliate; rays 6 or 7, short; achenia pubescent.—*Gray! in Sill. jour.* 42. *p.* 42.

Rocky places on the bald summit of the Roan Mountain, North Carolina (at an elevation of 6000 feet); where it was discovered, in 1835, by *Mr. Curtis!* Aug.–Sept.—Stems 8–10 inches high, growing in tufts from a branching caudex. Leaves membranaceous, 1–3 inches long, rarely an inch in width, irregularly and sometimes incisely serrate; the uppermost acute; the lower conspicuously ciliate along the entire narrowed base. Heads 25–30-flowered. Scales of the somewhat hemispherical involucre appressed, 1-nerved, slightly carinate, with scarious minutely lacerate-ciliate margins, acute or acuminate; the outer broadly, the inner narrowly lanceolate. Rays scarcely exserted.

† † Scales of the involucre very obtuse: achenia glabrous: leaves mostly feather-veined from a strong midrib: rays several.

28. *S. rigida* (Linn.): scabrous-pubescent, somewhat hoary; stem stout; the short compact racemes corymbose at the summit; leaves rigid; the lower mostly oval or oblong, serrate, petioled; the others ovate-oblong, closely sessile, slightly clasping; the uppermost entire; heads (very large)

about 34-flowered, crowded.—*Linn. spec.* 1. *p.* 880; *Ait.! Kew.* (*ed.* 1) 3. *p.* 216; *Michx.! fl.* 2. *p.* 118; *Pursh! fl.* 2. *p.* 543; *Ell.! sk.* 2. *p.* 390; *Hook.! fl. Bor.-Am.* 2. *p.* 5; *DC. prodr.* 5. *p.* 337. S. grandiflora, *Raf. in med. repos.* (*hex.* 2) 5. *p.* 359. Virga-Aurea Novæ-Angliæ, *Herm. parad. t.* 243. (poor.)

Dry soil, from Connecticut! New York! and Pennsylvania! to North Carolina! &c. along the mountains; and from Saskatchawan, Michigan! and Missouri! to Arkansas! and Texas! Aug.–Oct.—Stem 3–4 feet high, stout and rigid, clothed with a rough pubescence. Leaves thick, clothed with a minute and somewhat hoary pubescence, scabrous, or often rather soft or velvety beneath, more or less serrate with fine mostly appressed or somewhat crenate teeth; the radical ones 4 to 9 inches long, on petioles about the same length; the upper cauline reduced to 1–2 inches in length, broadly oval or ovate-oblong. Heads among the largest and most showy of the genus. Scales of the involucre oblong, very obtuse, slightly striate, pubescent or almost glabrous. Rays large, oblong, 7–10. Achenia very glabrous.

29. *S. corymbosa* (Ell.): stem stout, glabrous; the corymbose branches and short racemes hirsute-pubescent; leaves (cauline) oblong-lanceolate, closely sessile, rigid, glabrous, with minutely ciliate and very scabrous margins, mostly serrulate; heads (large) in short and loose fastigiate racemes, about 30-flowered.—*Ell.! sk.* 2. *p.* 378.

In the middle districts of Georgia, *Elliott!* Sept.–Oct.—"Stem 4–6 feet high, robust and virgately erect, branching near the summit, the young branches hirsute." *Ell.* Radical leaves unknown; the lower cauline 4–6 inches long, about an inch wide, coriaceous, the margin rough with close fine hairs; the upper similar but gradually reduced in size to about an inch in length, rather crowded, somewhat acute; the younger more ciliate, and the lower surface sometimes furnished with scattered hairs. Heads smaller than in S. rigida, but about twice the size of those of the following species, on rather slender bracteolate pedicels, disposed in loose short racemes terminating the corymbose branches, those of the lower or exterior racemes unilateral and recurved-spreading. Involucre minutely pubescent, similar to that of S. rigida. Rays about 10, rather large. Achenia perfectly glabrous. Pappus as long as the corolla of the disk. Doubtless distinct from the preceding, if the stem is constantly smooth. What is S. corymbosa, *Poir. suppl.*, of unknown origin, with rough crenate-toothed leaves?

30. *S. Ohioensis* (Riddell): very smooth and glabrous; stem strict, fastigiate-corymbose at the summit; radical and lowest cauline leaves lanceolate-oblong, obtuse, with ciliolate-scabrous margins, finely serrate towards the apex, tapering into slender petioles; the others oblong-lanceolate, closely sessile, mostly entire; heads (rather small) numerous, in a compound corymb, on slender glabrous pedicels, 16–20-flowered; pappus shorter than the corolla of the disk.—*Riddell! synops. fl. Western States, p.* 57.

Wet grassy prairies of Ohio, *Mr. Van Cleve! Dr. Riddell!* and of Indiana, *Mr. Lea!* Also in various parts of Western New York, *Dr. Sartwell! Dr. Knieskern! Mr. G. W. Clinton!* Sept.–Oct.—Plant 2–3 feet high, perfectly smooth, except the margins of the leaves; with a simple virgate stem, which is divided at the summit into a compound fastigiate corymb; the oblong heads all erect, and on slender pedicels. Leaves of a rather firm texture; the radical 5–8 inches long, an inch or an inch and a half in breadth, with petioles often about the same length; the cauline successively reduced in size (the uppermost about an inch long), rather crowded, erect. Scales of the narrow involucre 8–10, oblong, obtuse. Rays 6–7, small. Pappus scarcely longer than the perfectly glabrous achenia.

31. *S. Riddellii* (Frank): stem stout, glabrous, corymbose at the summit, the branches and pedicels pulverulent-pubescent; leaves lanceolate, elongated, acute, entire, glabrous, with scabrous margins, obscurely nerved; the radical on long carinate petioles; the cauline partly clasping or sheathing, carinate-conduplicate, mostly arcuate; heads (middle-sized) very numerous, clustered, forming a compound fastigiate corymb, 20–24-flowered.—*Frank! in Riddell, synops. l. c.* S. Mexicana β. floribus lato-corymbosis, *Hook.! compan. to bot. mag.* 1. *p.* 97.

Wet and grassy prairies, Ohio, *Dr. Riddell! Mr. Van Cleve! Dr. Paddock! Mr. Lea!* St. Louis, Missouri, *Drummond! Dr. Engelmann!* and on St. Peter's River, *Mr. Nicollet!* Wisconsin, *Mr. Lapham!* Sept.–Oct.—Stem about 2 feet high, very leafy to the summit. Leaves with a rather strong midrib, and 1 to 3 more or less distinct parallel nerves, forming numerous reticulations with the minute and close veinlets, thin but rather firm in texture; the radical a foot or more in length, including the elongated petioles, into which the limb (6–9 lines wide in the middle) is gradually attenuated, often falcate; the cauline 4–8 inches long, about half an inch wide, erect, appressed and partly sheathing at the base, above arcuate-spreading or recurved. Heads rather larger than in the preceding, much crowded on the branches of the large compound corymb, usually on short pubescent pedicels. Scales of the involucre narrowly oblong, 1-nerved, nearly glabrous. Rays 7–9, small and narrow. Achenia glabrous, or slightly and sparsely pubescent under a lens.—A beautiful and very distinct species, allied to the preceding.

† † † Scales of the involucre obtuse: achenia glabrous: leaves nerved: rays 2–3.

32. *S. nitida:* stem strict, very smooth below, fastigiate-corymbose at the summit; the branches and pedicels scabrous-pubescent; leaves rigid, very smooth and shining, nerved, lanceolate or linear, entire, acute, the margins ciliolate-scabrous towards the apex; the radical and lowest cauline tapering into short petioles; the others sessile; heads (middle-sized) in loose fastigiate corymbs, about 14-flowered.

Dry pine woods &c., Western Louisiana, *Dr. Leavenworth! Dr. Hale!* and Texas, *Drummond! Dr. Leavenworth!* Aug.–Oct.—Stem 2–3 feet high, slender or rather stout, simple, and terminated by a single fastigiate corymb, or somewhat branched near the summit; the branches rigid, erect, fastigiate, clothed with a short rough pubescence. Leaves varying from linear to rather broadly lanceolate, coriaceous, both surfaces very smooth and shining (the margins also smooth towards the base), rarely with one or two obscure serratures near the apex, furnished with 1 to 3 nerves or parallel veins on each side of the rather strong midrib; the radical and lowest cauline 4–8 inches long, 3–5 lines wide; the upper gradually reduced in size, numerous, spreading, sessile, but mostly narrowed at the base. Scales of the involucre nearly glabrous, oval, very obtuse. Rays 2–3, large. Achenia perfectly glabrous.—The leaves vary in width in different specimens from 2–3 lines to three-fourths of an inch. The plant exudes small quantities of resin when wounded.

33. *S. pumila:* stems several from a woody caudex, scarcely longer than the radical leaves, simple, angular; leaves rigid, lanceolate, entire, tapering to each end, mucronate-acute, smooth, somewhat glutinous, strongly 3-nerved; the radical petioled; heads (large for the size of the plant) in sessile clusters of 3–4 together, disposed in a small corymb; scales of the somewhat viscid and cylindrical involucre oval or oblong, carinate; rays 2–3, short; the disk-flowers about the same number.—Chrysoma pumila, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 325.

Open situations, on shelving rocks towards the western declivity of the Rocky Mountains [about lat. 41°], *Nuttall!*—Plant about a span high, in clusters from the same root. Leaves (persistent?) with somewhat scabrous margins, slightly veiny between the ribs. Scales of the involucre with scarious margins, obscurely mucronate.

* * * * *Natives of brackish swamps: racemes erect or spreading, paniculate: leaves thickish or fleshy, very smooth and entire, obscurely veiny, often somewhat triplinerved.*—Maritimæ.

34. *S. Mexicana* (Linn.): stem oblique, glabrous; leaves lanceolate, somewhat fleshy, very entire, smooth throughout; racemes paniculate, erect; peduncles squamose, glabrous; rays elongated, *Ait.*—*Linn.! hort. Cliff. p.* 409, *& spec.* 2. *p.* 879; *Ait.! Kew.* (*ed.* 1) 3. *p.* 215; excl. syn. *Tourn. Pluk. & Dodart.*, fide *Swartz, obs. p.* 306; *H. B. & K.! nov. gen. & spec.* 4. *p.* 104. S. limonifolia, *Pers. syn.* 2. *p.* 449, at least as to the character.

Described from specimens introduced into European gardens more than two hundred years ago, at first of reputed Mexican origin; but afterwards supposed to be a native of this country and not of Mexico; whence Persoon changed the name, and succeeding botanists have partially confounded it with the following species. It was most probably derived either from Mexico or the West Indies; since we have seen no native specimens of the United States which accord with the Linnæan plant, while the species of Humboldt does so: it is moreover given as a West Indian species by Swartz, who, by excluding the synonyms adduced by Linnæus, appears to have been aware that his plant was distinct from the more northern one; and in the Hortus Kewensis (where the plant is well characterized), a reference is made to the manuscripts of Sir Hans Sloane.—The heads are in small corymbose panicles, crowded at the summit of the stem, and in the axils of the obtuse upper leaves; the peduncles leafy; the pedicels with numerous subulate bracts, passing into the scales of the involucre, which are more pointed than in S. sempervirens. It should probably be excluded from the flora of extra-tropical North America; unless, indeed, the variety of S. limonifolia mentioned by Nuttall (*trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 328), as a native of the Californian coast, near St. Barbara, should be found to belong to this species.

35. *S. sempervirens* (Linn.): stem erect, glabrous; leaves fleshy, lanceolate, entire, acute, sessile, slightly clasping, obscurely triplinerved; the radical lanceolate-oblong, on elongated petioles; racemes paniculate (simple or compound), more or less secund and spreading; peduncles pubescent or nearly glabrous.—*Linn.! spec.* 2. *p.* 878; *Pursh, fl.* 2. *p.* 538; *Ell.! sk.* 2. *p.* 379; *DC.! prodr.* 5. *p.* 335. S. Noveboracensis & S. carnosa, *Mill. dict.* Virga-Aurea seu Solidago procerior, &c. *Pluk. alm. t.* 235, *f.* 5?

β. leaves thick and fleshy; racemes short, in a contracted panicle, more or less secund or turned to one side.—Virga-Aurea limoniifolio, &c. *Tourn. inst. p.* 404? *Pluk. alm. t.* 235, *f.* 2? Solidago lævigata, *Ait.! Kew.* (*ed.* 1) 3. *p.* 215; *Pursh, fl.* 2. *p.* 541; *DC. l. c.* S. limonifolia, *Pers.? and of authors.*

γ. leaves linear-lanceolate, tapering to each end, very acute, thickish; racemes erect, in a pyramidal rather strict panicle.—S. sempervirens, *Ait.! l. c.*

δ. leaves scarcely, or not at all fleshy, elongated lanceolate, tapering to each end, very acute; racemes short, mostly secund, in a close erect or somewhat decurved panicle.—S. viminea, *Ait.! Kew. l. c. p.* 215. S. integerrima, *Mill. dict.*, ex *Ait.*

In salt or brackish marshes along the coast of the United States! to Massachusetts! and Canada. Sept.–Oct.—Stem stout, 3–8 feet high. Margin

of the leaves sometimes scabrous. Heads large. Rays 8–10. Achenia, as in all the species of this section, somewhat pubescent.—We have possibly combined two or more species; but the form of the panicle, &c. is very variable, and the fleshiness of the leaves probaby varies with the saltness of the marsh; becoming almost membranaceous, as in var. δ., when the water is nearly fresh.

36. *S. angustifolia* (Ell.): very glabrous; stem erect, strict, simple, or sometimes branched at the summit; leaves thick, short, erect, lanceolate-linear, sessile, mucronate-acute, 1-nerved; the lower lanceolate, attenuate at the base; racemes short, erect or at length somewhat recurved, sometimes secund, disposed in a close and virgate erect panicle; peduncles and pedicels slender; heads small.—*Ell.! sk.* 2. *p.* 388; *DC.! prodr.* 5. *p.* 341.

In brackish swamps, Carolina! to Florida! Texas, *Drummond!* Sept.–Oct.—Plant with somewhat the habit of S. virgata. Stem 2–4 feet high, simple and virgate, or producing slender branches near the summit, and terminated by a contracted crowded panicle; the very numerous heads smaller, and the scales of the involucre narrower than in the preceding species. Upper leaves about an inch long, often subulate; the lower more scattered, less pointed, sometimes broadly lanceolate.—The leaves in the Texan specimens are more appressed.

37. *S. integrifolia* (Desf.): stem erect, simple, somewhat pubescent; leaves lanceolate, sessile, acuminate, slightly and obsoletely triplinerved, glabrous, entire, the lowest [rather obtuse] sparsely denticulate; racemes axillary, erect, somewhat panicled [forming an elongated rather large panicle]; pedicels pubescent; scales of the involucre acute; rays elongated. *DC.*—"*Desf.! cat. hort. Par. ed.* 1804, *p.* 103, & *ed.* 3. *p.* 402"; *Pers. syn.* 2. *p.* 449; *DC.! prodr.* 5. *p.* 340. (excl. syn. S. speciosa, *Nutt.*) S. elata, *Pursh, fl.* 2. *p.* 543, partly (spec. cult. *Soland.! in herb. Banks.*); not of *Ell.*

"North America."—We have only seen cultivated specimens, the origin of which is uncertain. The summit of the stem, peduncles, &c. are pubescent; the heads large; and the achenia pubescent.

* * * * * *Racemes spreading or recurved* (*scorpioid*), *secund: leaves veiny* (*sometimes indistinctly triplinerved*), *usually serrate.*—Secundifloræ.

† Leaves usually ample, serrate, loosely feather-veined; one of the veins on each side of the midrib sometimes stronger than the others, thus appearing slightly triplinerved: heads middle-sized.

38. *S. elliptica* (Ait.): stem erect, glabrous; leaves elliptical, smooth, serrate; racemes paniculate, secund; rays middle-sized, [peduncles and pedicels minutely pubescent; scales of the involucre narrow, acute; achenia strigose-pubescent]. *Ait.! Kew.* (*ed.* 1) 3. *p.* 214; not of *Ell.*, nor of *DC.?* S. latissimifolia, *Mill. dict.*, ex *Ait.* S. dubia, *Scopoli, fl. insub.* 2. *p.* 19, *t.* 10?

North America, *Hort. Kew.* Canada, *Mill. dict.*, in which the subjoined particulars are given.—"Stalks stiff, round, smooth, with a white bark, upwards of 3 feet high. Leaves spear-shaped, smooth, with several veins, 3½ inches long, one inch broad, alternate. Flowers from the upper axils, in short, erect, obtuse spikes, of a pale yellow color."—The characters we have added to the phrase of the Hortus Kewensis are derived from the authentic specimen, preserved in the Banksian herbarium. It is somewhat allied to the maritime species; and the same plant, if we mistake not, is found along the borders of salt marshes near New York. The latter has thickish, shining, oblong-lanceolate leaves, veiny, smooth, with scabrous margins, the upper

closely sessile and mostly entire: the short and dense racemes forming a crowded and leafy pyramidal panicle. Heads middle-sized. Rays 10–12.

39. *S. neglecta:* stem stout, smooth; leaves thickish, smooth and glabrous; the radical and lowest cauline oblong or ovate-lanceolate, appressed-serrate, petioled; the others elliptical or oblong-lanceolate, mostly acute at each end, sessile (often obscurely triplinerved) finely appressed-serrate; the upper entire; racemes short, dense, secund, somewhat spreading, disposed in an elongated or pyramidal somewhat leafy panicle; peduncles and pedicels nearly glabrous; scales of the 8–12-flowered involucre oblong, obtuse; rays rather large; achenia nearly glabrous.

In swamps, Massachusetts! and New York! to North Carolina! and Indiana! Aug.–Sept.—This not uncommon Solidago has doubtless been noticed; but we cannot refer it, with reasonable probability, to any described species. It is distinguished from S. arguta by its elongated panicle, with short racemes, which are at first erect (the lower often shorter than the leaves which subtend them); by the larger heads with much fewer flowers, &c.: from S. Muhlenbergii by the more entire and rigid, seldom acuminate leaves, more strict and terete stem, fewer-flowered heads, &c.: from S. elliptica by the broad and obtuse scales of the involucre (which are pubescent-ciliate at the tips), and the smooth achenia. The primordial radical leaves are oblanceolate or narrowly oblong, finely crenate-serrate, often obtuse, tapering into slender petioles; which are frequently succeeded by larger acuminate radical leaves, resembling those of S. arguta, but less strongly serrate. Several varieties occur; as 1, with coriaceous leaves, deep green above, the margins scarcely scabrous; the panicle either small and strict, or large and loose, with many of the lower racemes often shorter than the leaves (Can this be S. verrucosa, *Schrad.?*), or sometimes compound from the stem producing corymbose branches at the summit (this is possibly the S. dubia, *Scopoli*, *Smith*, the S. Cleliæ, *DC.*): 2, leaves less rigid, with very scabrous margins, the cauline elliptical or oblong-lanceolate, short, more entire; panicle large and often crowded: 3, leaves longer and narrower, often triplinerved above the middle; sometimes sharply serrate; and 4, if we mistake not, with the leaves slightly scabrous. Sometimes the racemes are erect, at least until old, and but slightly secund, approaching S. stricta.

40. *S. patula* (Muhl.): stem angled and striate, smooth, usually branched above; leaves (large) elliptical, acute, serrate, entirely smooth and glabrous beneath; racemes mostly short and crowded on the elongated somewhat leafy branches, at length spreading or recurved; peduncles scabrous-pubescent; scales of the involucre oblong; rays 6 or 7, the disk-flowers 8–10; achenia sparsely and minutely pubescent.—*Muhl.! in Willd. spec.* 3. *p.* 2059; *Beck. bot. p.* 190; *Darlingt.! fl. Cest. p.* 457. S. asperata, (*herb. Banks., mss.*) *Pursh, fl.* 2. *p.* 538; *Hook.! fl. Bor.-Am.* 2. *p.* 3. S. angulata, *Schrad. in DC. prodr.* 5. *p.* 331?

β. strictula: stem simple or nearly so; the very short racemes, at first erect and scarcely secund, constituting a virgate compound raceme; upper leaves small.—S. salicina, *Ell. sk.* 2. *p.* 389. S. scabra, *Hook.! compan. to bot. mag.* 1 *p.* 97.

Swamps, meadows, and moist woods, Canada, Massachusetts! New York! and Wisconsin! to Georgia! and Louisiana! (not uncommon.) *β.* North Carolina! to Florida! and Louisiana! Aug.–Sept.—This species is readily distinguished by the shagreen-like roughness of the upper surface of the ample somewhat coriaceous leaves, and their livid or leaden hue, especially in dried specimens; while the pale lower surface is perfectly smooth (a character pointed out by Dr. Darlington, but unaccountably omitted by Willdenow, although mentioned by Muhlenberg in his mss. Flora Lancastriensis); and also by the strongly-angled stem, and the pretty large heads disposed

in short racemes on the spreading branches. Sometimes the stem is simple, with the short and crowded racemes at first erect, and scarcely secund when old. The leaves are rather finely serrate, coarsely veined, the veins conspicuous on the lower surface; the radical often 6 inches long and 3–4 broad, abruptly narrowed into a winged petiole; the lower cauline nearly similar, narrowed at the base, or contracted into a short winged petiole; the upper successively smaller and more closely sessile, lanceolate-oblong, acute or sometimes obtuse. When it grows in deep shade, the leaves become more membranaceous and less scabrous.

41. *S. arguta* (Ait.): smooth and glabrous throughout, except the minutely ciliate margins of the leaves; stem strict; radical and lower cauline leaves large, elliptical or lanceolate-oval, veiny, sharply serrate, with spreading teeth, acuminate, tapering into winged and ciliate petioles; the others lanceolate or oblong, somewhat triplinerved, tapering to each end, sessile, serrate, the uppermost entire; racemes dense, at length elongated and recurved, forming a crowded corymbose panicle; scales of the involucre appressed; rays 8–12, small, the disk-flowers about 10; achenia scarcely pubescent.—*Ait.! Kew.* (*ed.* 1) 3. *p.* 313; *Pursh, fl.* 2. *p.* 538; (*Ell. sk.* 2. *p.* 374?) *DC. prodr.* 5. *p.* 333; not of *Muhl., Darlingt., &c.* S. ciliaris, *Muhl.! in Willd. spec.* 3. *p.* 2056; *Darlingt.! fl. Cest. p.* 455; *DC. prodr.* 5. *p.* 331. S. argentea, *Hornem. suppl.*, ex *DC.*

β. juncea: lower leaves narrower and less deeply serrate, the upper more entire.—S. juncea, *Ait.! Kew. l. c.; Pursh, l. c.; Hook.! fl. Bor.-Am.* 2. *p.* 3; not of *Ell.*, nor of *DC.*

γ. scabrella: leaves, especially the lower, scabrous or roughish-pubescent, at least beneath; racemes somewhat pubescent.

Meadows, fields, &c. either in dry or moist places. *α.* & *β.* Canada (from Subarctic America, *Richardson!*) and throughout the Northern and Western States! to South Carolina! *γ.* Barrens of Indiana, *Dr. Clapp!* Marshes around Louisville, Kentucky, *Dr. Short!* Wisconsin, *Mr. Lapham!* Aug.–Sept.—A rather stout species, 2–4 feet high, apparently well distinguished by the very numerous heads, mostly smaller than in any of its allies, compactly disposed in long, at length recurved racemes, which form an ample and dense fastigiate-corymbose panicle; by the much appressed and rigid somewhat carinate scales of the involucre (the exterior ovate-oblong); the small rays; glabrous branches of the inflorescence, with the bracts usually ciliate, &c. The radical and lower leaves are frequently very large, ovate-oblong or elliptical, and sharply and coarsely serrate; this form is the S. arguta of Aiton, according to specimens compared by Dr. Boott, &c.: when they are narrower and less coarsely serrate, it is the S. juncea, *Ait.*, &c. The young achenia are more or less pubescent under a lens; but when mature they are almost glabrous.

42. *S. Muhlenbergii:* stem angled, glabrous; leaves (large and thin) smooth and glabrous both sides, very sharply and strongly serrate; the radical ovate, on winged (naked or ciliate) petioles; the cauline elliptical-lanceolate, strongly acuminate, tapering into a narrow base or margined petiole; the uppermost somewhat entire; racemes pubescent, short, spreading, disposed in an elongated open panicle; scales of the involucre oblong-linear; rays 6–7, large; the disk-flowers about 12; achenia glabrous.—S. arguta, *Muhl.! fl. Lancast. ined., & herb.; Darlingt.! fl. Cest. p.* 458; not of *Ait.*, nor of *Ell.* (ex char.)

Low or shady grounds, Massachusetts! Vermont! New York! and Pennsylvania! Aug.–Sept.—Stem 2–3 feet high, simple, or branched at the summit. Leaves very sharply and often doubly serrate with narrow teeth, as in those of S. latifolia, which they somewhat resemble, the acuminate base and apex mostly entire. Panicle often simple at the summit; the

lateral branches or racemes mostly short, more or less secund, but seldom recurved: the heads crowded, larger than in S. arguta, and as large as in S. speciosa; the rays also pretty large.—This plant best deserves the name of S. arguta, for which Muhlenberg and Darlington have taken it: but the original species of that name appears to be the S. ciliaris of these authors. It is said to resemble the S. ambigua, in which species the racemes are not secund, and the achenia are almost villous.

43. *S. Boottii* (Hook.): stem usually branching; radical and lowest cauline leaves ovate or oblong-lanceolate, serrate, on slender margined petioles; the others lanceolate or ovate-lanceolate, appressed-serrate (or the upper entire), acuminate at both ends, or contracted into a winged petiole; racemes loosely paniculate, elongated; scales of the involucre narrowly oblong, obtuse; rays 2–5; the disk-flowers 8–12; achenia minutely pubescent.

a. stem slender, glabrous; the lax spreading branches pubescent, bearing (few or solitary) rather loose secund racemes; leaves glabrous, with scabrous margins, the upper entire.—S. Boottii, *Hook.! compan. to bot. mag.* 1. *p.* 97, (the specimens destitute of the lower leaves, &c.)

β. stem slender, glabrous; racemes very loose, paniculate; lower leaves somewhat pubescent, or sometimes nearly all scabrous-pubescent on both sides.

γ. stem and both surfaces of the leaves scabrous-pubescent; branches slender, bearing rather loose and often simple racemes.

δ. glabrous, except the branches; stem stouter; leaves attenuate-acuminate at both ends, often very sharply serrate; racemes rather dense, secund, recurved, forming a sparse terminal panicle.—S. juncea? *Ell.! sk.* 2. *p.* 375, not of *Ait.*

ε.? glabrous; stem stout; leaves rigid, oblong, less acuminate, the lower serrate with spreading teeth; racemes dense, very numerous, forming an ample compound panicle.

Sandy fields and woods, North Carolina! to Florida! and Louisiana! *a.* Louisiana, *Drummond!* Florida, *Dr. Leavenworth!* *β.* Louisiana, *Dr. Leavenworth! Dr. Hale!* *γ.* Georgia, *Dr. Boykin!* *δ.* Southern States! apparently common. *ε.* Louisiana, *Dr. Leavenworth! Dr. Hale!* Texas, *Drummond.!* Aug.–Oct.—Variable in many respects, yet apparently a well marked species, 2–5 feet high, with rather large heads: when the latter are loose, the pedicels are furnished with several subulate bracts.

44. *S. gracillima:* smooth and glabrous throughout; stem virgate, branched towards the summit; the branches strict, very long and slender, leafy, terminated by single virgate secund racemes with the apex somewhat recurved, sometimes compound at the base; leaves narrowly spatulate-linear, rather obtuse, tapering to the base, with ciliolate-scabrous margins, entire, the lowermost sparingly serrate; scales of the involucre narrowly oblong, obtuse; rays mostly wanting; achenia pubescent.

Middle Florida, *Dr. Chapman!*—Stem 2–3 feet high, terete, strict and slender. Leaves rather rigid; the lowest 3–4 inches long, and about half an inch wide towards the apex, oblanceolate, with a gradually attenuate base or winged petiole, and a rather strong mid-nerve, obsoletely triplinerved above the middle, the veinlets obscure, usually somewhat serrate; the others entire and gradually reduced in size, linear with a narrowed base; those of the branches numerous, about an inch long, scarcely a line in width. Racemes virgate, 3–5 inches long, terminating the numerous branches; the broadly obconic heads entirely unilateral, large in proportion (as large as in S. Boottii), crowded, on very short pedicels: the summit of the main stem often producing a virgate panicle; the lateral racemes short and spreading. Disk-flowers 10–14: rays none, or very rarely solitary (3-toothed), in the specimens examined.

45. *S. linoides* (Soland. in herb. Banks.): smooth and glabrous; stem slender, simple; leaves lanceolate, finely appressed-serrate, with ciliolate-scabrous margins; the radical and lower cauline acute or acuminate at both ends, on slender ciliate petioles; the upper often oblong, sometimes entire; panicle small, turned to one side (rarely compound), the short racemes at length open, secund; scales of the involucre oblong-linear, obtuse, appressed; rays 1–3, short, the disk-flowers 4–5; achenia glabrous.—Bigelovia! uniligulata, *DC.! prodr.* 5. *p.* 329, excl. syn. Chrysoma uniligulata, *Nutt. in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 325. Solidago uliginosa, partly, *Nutt.! in jour. acad. Philad.* 7. *p.* 101.

Sphagnous swamps of Wading River, &c. in the pine barrens of New Jersey! Near Boston, *Mr. Greene!* (in *herb. Hook.*) Sept.-Oct.—A slender plant, 12 to 20 inches high; with a panicle only 3 or 4 inches long, somewhat contracted, usually turned to one side; the short and rather crowded racemes at length spreading or somewhat recurved; heads small. Radical and lowest cauline leaves 2–5 inches long, tapering into a petiole about the same length, half an inch wide; the upper gradually reduced in size, less tapering, sessile. Achenia often with a few minute scattered hairs when young.—Somewhat allied to S. virgata, and especially to S. stricta: it is a more slender plant than the latter, with a different inflorescence, and fewer flowers. The ray is frequently reduced to a single flower, and those of the disk to four; but we quite as commonly find 2 to 4 rays (in the specimens from which De Candolle was supplied), showing the little consequence that can be attached to this character: nearly every section of Solidago presents species with only one or two rays.—We have adopted the name which, according to Dr. Boott, was applied to this species by Solander. This and S. stricta appear to have been more or less confounded by Nuttall under his S. uliginosa; Dr. Pickering's specimens from "sphagnous swamps and marshy thickets in Massachusetts," preserved in the herbarium of the Academy of Natural Sciences, belonging entirely to S. stricta; while others from *New Jersey* belong to the present species.

† † Leaves (small) serrate, copiously feather-veined, the veinlets conspicuously reticulated: heads small.

46. *S. altissima* (Linn.): stem hirsute with rough hairs; leaves ovate-lanceolate or oblong-lanceolate, acute at each end or acuminate, sessile, coarsely serrate with sharp and unequal spreading teeth, strongly feather-veined and more or less reticulated, often rugose, scabrous above, hirsute on the veins beneath; racemes paniculate, secund (ascending or recurved); scales of the involucre linear; rays 6–9, small; the disk-flowers 4–7; achenia pubescent.—*Linn. spec.* 2. *p.* 878; *Ait.! Kew.* (*ed.* 1) 3. *p.* 212; *Willd. spec.* 3. *p.* 2058; *Bigel. fl. Bost. ed.* 2. *p.* 305; *Hook.! fl. Bor.-Am.* 2. *p.* 2; *Darlingt.! fl. Cest. p.* 456. (Virga-Aurea spec. *Dill. Elth. f.* 391, 392, & 393.) (S. altissima, pilosa, recurvata, & Virginiana, *Mill. dict.* S. altissima, aspera, rugosa, & villosa, *Pursh, fl.* 2. *p.* 536. S. altissima, aspera, rugosa, & humilis, *DC.! prodr.* 5. *p.* 333. &c.)

β. stem villous; leaves thin, strongly and sharply serrate, often nearly smooth and glabrous above, and rather softly hairy on the veins beneath.—S. altissima *β. Ait. l. c.* S. villosa, (*Herb. Banks!*) *Pursh! fl.* 2. *p.* 537; *Hook.! fl. Bor.-Am.* 2. *p.* 2; not of *DC.*—Varies, with the racemes at first erect, at length recurved. S. humilis, *Desf.! cat. hort. Par. ed.* 3. *p.* 402; *DC.! prodr.* 5. *p.* 336; not of *Pursh.*

γ. stem scabrous-pubescent or somewhat hirsute; leaves serrate with appressed teeth, varying from ovate-oblong to lanceolate (the uppermost not narrowed at the base), reticulated, mostly rugose.—Virga-Aurea Novæ Angliæ rugosis foliis crenatis, *Dill. Elth. t.* 308, *f.* 396. Solidago rugosa, *Mill.; Willd. spec.* 3. *p.* 2058; *Ait. Kew.* (*ed.* 2) 5. *p.* 66; *Pursh! fl.* 2.

p. 537; *Ell.! sk.* 2. *p.* 574; *Hook.! l. c.* (Varies, with the stem hirsute, as in *icon. Dill.*, and in S. ulmifolia, *Ell.! sk.* 2. *p.* 373 (spec. ex *Muhl.!*), not of *Muhl. herb.* or *Willd.*; or scabrous with a short pubescence; with the leaves either very scabrous, or almost smooth and glabrous; the lowermost frequently serrate with sharp salient teeth, as in var. *a.*

δ. leaves elliptical or oblong-ovate, short, crenate-serrate, very strongly rugose, scabrous above; the lower surface, with the stem, pubescent with close rather soft hairs.

ε. leaves ovate-elliptical or oblong, serrate with small and sharp mostly appressed teeth, somewhat rugose, very scabrous above, scabrous-pubescent beneath.—Virga-Aurea aspera, &c. *Dill. Elth. t.* 305, *f.* 392. Solidago aspera, *Ait.! Kew.* (*ed* 1) 3. *p.* 212; *Willd. l. c.*; *Muhl.! cat. p.* 79; *Ell.! sk.* 2. *p.* 371. S. scabra, *Nutt.*; *DC. l. c.?* not of *Muhl.*

Borders of fields and thickets, mostly in low or rich ground, Canada! Newfoundland! & Labrador! (chiefly var. *β.*) and nearly throughout the United States! very common. *δ.* Louisiana, *Drummond! Dr. Ingalls! Dr. Leavenworth!* *ε.* Pennsylvania, *Muhlenberg!* to Georgia, *Dr. Boykin!* Aug.–Oct.—One of the most common *Golden-Rods*, exhibiting a great variety of forms; of which we have only characterized the more striking. A correct view of the species, we think, is taken in the first edition of the Hortus Kewensis. We are in doubt as to the plant originally intended by Linnæus, but the synonyms adduced, at least those of Dillenius, belong to this species. The specific name is not always appropriate: the plant varies from 2 or 3 to 6 or 7 feet in height.

47. *S. ulmifolia* (Muhl.): stem smooth and glabrous, the branches hairy; leaves membranaceous, elliptic-ovate or oblong-lanceolate, sessile, tapering to the base, acuminate, coarsely and unequally serrate (the uppermost entire), loosely veined, smooth above, softly hairy beneath, especially the midrib and margins; racemes paniculate, recurved-spreading; scales of the involucre lanceolate-oblong; rays about 4, short; achenia minutely pubescent.—*Muhl.! in Willd. spec.* 3. *p.* 2060; *Pursh, fl.* 2. *p.* 538; *Darlingt.! fl. Cest. p.* 457; *DC. prodr.* 5. *p.* 333 (ex char.); not of *Ell.*

Woods and low grounds, Northern and Western States! and along the upper country to Alabama! Aug.–Sept.—Resembles some states of the preceding species; but the striate stem is glabrous, or with scattered soft hairs, and the thin leaves are softly pubescent or villous beneath, and either glabrous or sparsely hairy above, &c.: the radical leaves are elliptic-ovate, with winged petioles. The specific name is not appropriate, but this is the plant described by Willdenow, and of Muhlenberg's herbarium, yet not the one sent by the latter to Elliott.

48. *S. Drummondii:* stem and lower surface of the leaves, especially the veins, minutely velvety-pubescent; leaves ovate or broadly oval, acute at each end, almost petioled, sharply serrate, veiny, somewhat triplinerved, smooth and slightly pubescent on the veins above; those of the branches entire; racemes secund, paniculate; scales of the involucre oblong, obtuse; rays 4–5, small; the disk-flowers 5 or 6; achenia pubescent.—"S. ulmifolia, *Ell.?*" *Hook.! compan. to bot. mag.* 1. *p.* 97.

St. Louis, Missouri, *Drummond!* Louisiana, *Dr. Leavenworth!*—Upper part of the stem (the lower portion not seen), with the branches and peduncles, clothed with a fine and close velvety pubescence, leafy to the summit. Leaves 2 inches or more in length, about an inch and a half wide, of a rather firm texture; abruptly acute at both ends, appearing slightly petioled, strongly serrate; the younger slightly pubescent above; those of the branches small, often obtuse, Heads nearly as large as in S. altissima. Involucre nearly glabrous. Pappus rather shorter than the corolla of the disk-flowers.

49. *S. amplexicaulis* (Martens?): stem velvety-pubescent, loosely branched above; leaves (thin) very veiny and reticulated, softly pubescent beneath, scabrous above, serrate, acute or acuminate; the radical ovate or oblong, abruptly narrowed into a slender margined petiole; the lower cauline contracted as if into a winged petiole, with a dilated auriculate-clasping base; the upper ovate-lanceolate, somewhat panduriform, auriculate-clasping; the uppermost usually entire; racemes loosely paniculate, secund; scales of the involucre lanceolate; achenia minutely and softly pubescent; disk-flowers 5–8; rays 1 or 2.—S. amplexicaulis, *Martens, mem. acad. sci. Bruxelles*, 1841? fide *L'Institut, May* 13, 1841; but we merely judge from the appropriates of the name, having seen no description.

Louisiana, *Dr. Leavenworth!* Missouri, *Mr. Duerinck?* (Also? Middle Florida, *Dr. Chapman!*) Sept.–Oct.—A singular species (2–4 feet high), very remarkable on account of its auriculate-amplexicaul leaves, which are not unlike those of Aster prenanthoides, or A. patens *var.* phlogifolius. Those of the stem are about 3 inches long, an inch and a half wide in the middle, tapering to an acute apex, abruptly contracted below (the contracted portion entire), and again much dilated at the insertion; this clasping portion being either entire, or sharply serrate: the lowest leaves are similar, except that the contracted portion is longer and narrower; while the upper, gradually reduced in size and often entire, are less contracted below. Racemes small, irregular. Heads small. Scales of the somewhat pubescent involucre narrow, rather loose. We more commonly observe but a single ray-flower.

50. *S. brachyphylla* (Chapman! mss.): stem scabrous-pubescent, often virgately branched above, very leafy; leaves glabrous, with ciliate-scabrous margins, obscurely veiny; the lowest oblong-spatulate, tapering into a short margined petiole, appressed-serrate; the others oval or ovate, short, closely sessile, often nearly entire; the secund racemes disposed in a virgate panicle; scales of the involucre oblong, obtuse; achenia minutely canescent; disk-flowers 5–6; rays none!

Middle Florida, in fertile soil, *Dr. Chapman! Dr. Alexander!* Georgia & Alabama, *Baldwin! Le Conte!*—Stem 4–6 feet high, often much branched above; the branches elongated, erect. Leaves pale beneath, somewhat shining above; the lower about 3 inches long; the upper and those of the branches an inch to half an inch in length, half an inch or less in breadth, elliptical, ovate, or roundish, entire or sparingly serrate, sometimes mucronulate-acute, the lower surface rather obscurely reticulate-veined. Heads about the size of those of S. altissima. Scales of the involucre glabrous, very minutely ciliate; the exterior very short.—We find no rays in this well-marked species; but some of the exterior flowers are occasionally destitute of stamens.

51. *S. Elliottii:* smooth and glabrous throughout; leaves very numerous, oblong-lanceolate or elliptical, mucronate-acute or somewhat acuminate, sessile, veiny, the margins scabrous, serrate with small appressed teeth, the upper often entire; heads in crowded recurved racemes, forming a pyramidal panicle; scales of the involucre linear, obtuse; rays 8–10, scarcely longer than the (5–7) disk-flowers; achenia minutely pubescent.—S. elliptica! *Ell.! sk.* 2. *p.* 376 (founded on a branched specimen, with the panicle more leafy and irregular than usual), not of *Ait.*

Damp rich soil, in the low country of the Southern States, from Cape Fear River, North Carolina, *Mr. M. A. Curtis!* & Paris Island, *Elliott!* to Georgia, *Le Conte!* (& *herb. Z. Collins!*) Sept.–Oct.—Stem 3–6 feet high, simple, or sometimes branched above, the branches or summit angled; the peduncles and pedicels more or less pubescent.—Allied to S. pilosa, and very similar in the inflorescence, heads, &c. but differs in the smooth stem

and leaves; the latter more veiny (the primary veins evident and often reticulated), pale beneath, instead of green both sides, (2–3 inches long, an inch or less in width, the upper smaller); the panicle perhaps more elongated; and the scales of the involucre broader and more obtuse.

† † † Leaves entire, or slightly serrate, the primary veins nearly obsolete; the minutely pellucid-reticulate veinlets inconspicuous except by transmitted light: heads small: scales of the 5–15-flowered involucre few, membranaceous, narrow.

52. *S. pilosa* (Walt.): stem hirsute with spreading hairs, strict, often branching above, very leafy; leaves oblong-lanceolate, serrulate, slightly scabrous, mostly hairy along the midrib, often pubescent beneath, obscurely veined; the upper ovate-lanceolate or oblong, erect, closely sessile, mostly entire; the recurved racemes disposed in a dense pyramidal panicle; rays 7–10, scarcely longer than the about 5 disk-flowers; achenia minutely pubescent.—*Walt.! Car. p.* 207, not of *Mill. dict.?* S. altissima, *Michx.! fl.* 2. *p.* 118, ex *herb.* S. pyramidata, *Pursh, fl.* 2. *p.* 537; *Nutt.! gen.* 2. *p.* 159; *DC. l. c.* S. villosa, *Ell.! sk.* 2. *p.* 372; *DC.! prodr.* 5. *p.* 333; not of *herb. Banks!* S. Bosciana, *Moretti*, ex *DC.*

Damp soil, from Florida! Alabama! and Louisiana! to the pine barrens of New Jersey! Sept.–Oct.—Stem 3–7 feet high, robust, villous-hirsute, especially towards the summit, with whitish jointed hairs, often paniculately branched at the summit; the branches or the numerous racemes recurved-spreading. Leaves thickish or rather firm, pale green, closely sessile or partly clasping, nearly veinless except by transmitted light, or sometimes with the primary veins apparent; the prominent midrib, and often the scabrous margins fringed with long hairs; the surfaces often glabrous, but sometimes scabrous-pubescent above and villous-pubescent beneath: lower leaves 2–3 inches long, lanceolate-oblong, sharply serrulate, mostly acute, often narrowed at the base; the upper gradually reduced to about half an inch in length, 3–5 lines in width. Heads very numerous, about as large as in S. odora. Bracts subulate. Exterior scales of the glabrous involucre lanceolate-subulate; the inner linear. Pappus about as long as the corolla of the disk.

53. *S. odora* (Ait.): stem simple or sparingly branched, somewhat pubescent in lines, often declined; leaves linear-lanceolate, entire, very glabrous, with minutely scabrous margins, punctate with pellucid dots; racemes paniculate; rays 3 or 4, rather large; the disk-flowers 3–4; achenia minutely hairy.—*Ait.! Kew.* (*ed.* 1) 3. *p.* 214; *Pursh, fl.* 2. *p.* 539; *Ell.! sk.* 2. *p.* 376; *Bigel.! med. bot.* 1. *p.* 188, *t.* 20, & *fl. Bost. ed.* 2. *p.* 304; *Hook.! fl. Bor.-Am.* 2. *p.* 3; *Darlingt.! fl. Cest. p.* 457; *DC.! prodr.* 5. *p.* 334. S. retrorsa, *Michx.! fl.* 2. *p.* 117; *Ell.! sk.* 2. *p.* 377. Virga-Aurea Americana Tarraconis facie et sapore, &c. *Pluk. alm. t.* 116, *f.* 6.

β. leaves less evidently punctate, and nearly destitute of anisate odor.

Borders of thickets, in dry or sandy soil, Canada (*Pursh*) and New Hampshire! to Florida! and Louisiana! (Also a Mexican & South American species!) Aug.–Oct.—Stem 2–3 feet high, rather slender, often reclined. Leaves closely sessile, spreading, or at length reflexed, 1 to 3 or 4 inches long, one-fourth to more than half an inch wide near the base, tapering to a point; the midrib prominent and smooth; the veins and minutely reticulated veinlets inconspicuous except by transmitted light. Panicle mostly secund, as well as the racemes. Pedicels slender. Bracts subulate. Scales of the involucre few, nearly glabrous; the exterior short; the others linear, rather acute. Pappus shorter than the corolla of the disk.—The leaves yield a volatile oil by distillation, and when bruised exhale a fine anisate odor. A plant is frequently found growing with the ordinary S. odora, which is only to be distinguished by the absence of this agreeable odor, having instead the scent of S. Canadensis, &c.; but the pellucid dots, or reservoirs of vola-

tile oil, are evident in the leaves of this plant, with the aid of a lens, although less abundant than in the common form.

54. *S. tortifolia* (Ell.): stem frequently branched, scabrous-pubescent above; leaves small (very numerous) linear, spreading, often twisted at the base, sparingly serrate; the upper surface with the margins and midrib scabrous, not punctate; the recurved racemes in a pyramidal panicle; rays 3–5, small; the disk-flowers 3–5; achenia slightly pubescent.—*Ell.! sk.* 2. *p.* 377; *Hook.! compan. to bot. mag.* 1. *p.* 97. S. odora, *Michx.! fl.* 2. *p.* 118, not of *Ait.*

Dry fields, &c. North Carolina! to Florida! Louisiana! and Texas! Aug.–Oct.—Stem erect, about 3 feet high, often much branched. Leaves an inch or more in length, 2–4 lines wide, usually serrate with a few scattered teeth, the minutely reticulated veins pellucid, not punctate; the lowermost about 3 inches long, obscurely somewhat triplinerved. Heads smaller than in S. odora; the scales of the involucre obtuse. Pappus nearly equalling the corolla of the disk.—In the Texan plant both surfaces of the leaves are equally puberulent-scabrous.

† † † † Leaves somewhat cinereous or canescent, thickish, feather-veined, and more or less evidently triplinerved, the veinlets reticulated: heads middle-sized (racemes sometimes crowded and scarcely secund).

55. *S. nemoralis* (Ait.): clothed with a very short cinereous pubescence; stem simple or corymbosely branched above; radical leaves oblanceolate, spatulate, or obovate-cuneiform, tapering into a petiole, mostly crenate-serrate; cauline oblanceolate or spatulate-oblong, sessile, nearly entire, somewhat scabrous; racemes numerous, short, dense, at length recurved-spreading, forming a crowded compound raceme or panicle usually turned to one side; scales of the involucre linear-oblong, appressed; rays 6–9, rather short; the disk-flowers 3–6; achenia appressed-pubescent.—*Ait.! Kew.* (*ed.* 1) 3. *p.* 213; *Pursh, fl.* 2. *p.* 537; *Ell.! sk.* 2. *p.* 373; *Hook.! fl. Bor.-Am.* 2. *p.* 3; *Darlingt.! fl. Cest. p.* 456; *DC.! prodr.* 5. *p.* 333. S. hispida, *Muhl. in Willd. spec.* 3. *p.* 2063, fide *herb. Muhl.!* &c. S. cinerascens, *Schweinitz! in Ell. l. c.*

β. dwarf and more canescent; leaves mostly entire; panicle contracted, somewhat virgate.

γ. leaves more scabrous; the upper short, obovate-spatulate.

Dry or sterile fields, &c. Canada! (from the Saskatchawan!) and throughout the United States! common. *β.* On the Assiniboin River, *Douglas!* and towards the sources of St. Peter's River, *Mr. Nicollet!* *γ.* Texas, *Drummond!* Louisiana, *Dr. Hale!* Kentucky, *Dr. Short!* Manitou Island, Lake Michigan, *Dr. Engelmann!* Sept.–Oct.—A well known species, remarkable for its grayish hue and dense inflorescence. The stem (1–3 feet high, in *β.* 6–10 inches) is often entirely simple, and terminated by a small and contracted, more or less elongated and decurved panicle, composed of short glomerate racemes; frequently it produces several such panicles, racemosely or corymbosely arranged: sometimes the stem is much branched at the summit, producing many compound panicles. Scales of the involucre minutely pubescent-ciliate. The var. *γ.* is a more rigid and scabrous form.

56. *S. Radula* (Nutt.): stem simple, scabrous-pubescent; leaves cuneiform-spatulate, sessile, hispidly pubescent, very scabrous, toothed towards the apex; the lowest tapering into a somewhat petiolate base; the upper oblong, mostly entire; panicle contracted, turned to one side, simply racemose at the summit; the racemes short, secund; scales of the involucre oblong, appressed; disk-flowers and rays each 3–6, the latter very short; achenia

minutely pubescent.—*Nutt.! in jour. acad. Philad.* 7. *p.* 102, & *in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 327.

Dry ground, Arkansas, *Nuttall!* Western Louisiana, *Dr. Leavenworth! Dr. Hale!* Missouri, *Dr. Engelmann!* Sept.—Plant 10–18 inches high, rather slender. Radical leaves unknown: the cauline rather crowded and rigid, rough, minutely hispid-ciliate, reticulated; the lowest (sometimes lanceolate-elliptical and acute) 2–3 inches long, half an inch wide near the apex; the upper successively smaller and more oblong or ovate-lanceolate, and entire, mucronulate. Heads rather smaller than in S. nemoralis, crowded. Bracts minute.

57. *S. scaberrima:* stem corymbose at the summit, very scabrous; cauline leaves crowded, ovate or elliptical, closely sessile, rigid, very scabrous, somewhat triplinerved; the lower coarsely serrate-toothed; the uppermost and the lowest bracts roundish, entire; racemes numerous, recurved, forming a fastigiate compound panicle; the heads crowded, strongly secund; disk-flowers and rays each 4–6, the latter very short; achenia nearly glabrous.

Texas, *Drummond!*—The specimens consist of the upper portion of an apparently large species; the thick and coriaceous leaves 1 to 2 inches long, 8–9 lines wide, triplinerved and reticulated, scarcely acute or pointed at either end; the upper smaller and rounder, closely sessile by a very obtuse base; those of the branches and the lowest bracts small, nearly orbicular. Racemes somewhat elongated. Involucre, &c. as in the preceding.—Differs from the character of S. rotundifolia, *DC.* in the secund and much spreading racemes, and the sharply toothed lower leaves. It agrees with the present group in habit and character; but the lower leaves are so manifestly triplinerved that it might be referred to the following division.

58. *S. nana* (Nutt.): pulverulently canescent; stems several from a somewhat ligneous caudex, simple: radical and lowest cauline leaves spatulate, entire or obscurely serrulate towards the apex, on short petioles; the others linear, narrowed at the base, sessile, entire, scattered; panicle thyrsoid-corymbose; scales of the involucre ovate, obtuse; rays 6–7, rather large; achenia appressed-pubescent.—*Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 327.

Rocky Mountains near Lewis River, *Nuttall!*—About a span high. Leaves obscurely triplinerved, soft, obtuse; the radical an inch or more in length. Branches of the inflorescence erect; the lower slender, bearing 5–8 scarcely secund heads (smaller than in S. nemoralis) towards the summit. Involucre somewhat pubescent.

59. *S. incana:* clothed with a close canescent-tomentose pubescence, when old slightly scabrous; stems low, numerous from a suffruticose base; leaves crowded, thick, oval or oblong, mostly obtuse, sessile, triplinerved; the lower oblong-spatulate, sparingly serrate towards the apex, tapering to the base; racemes short, glomerate, crowded in a dense thyrsoid oblong panicle, at length somewhat spreading and secund; scales of the involucre oval-oblong; rays 5–8; achenia appressed-pubescent.

β. ? leaves cinereous-canescent and somewhat scabrous (not tomentose), lanceolate, acute at both ends, finely and sharply serrate above the middle, or nearly entire; heads mostly smaller; scales of the involucre oblong-linear.

Prairies between the upper Mississippi and the Missouri, *Mr. Nicollet!* β. Margin of the Lake of the Woods, *Mr. Nicollet!* Saskatchawan, *Drummond!* (in *herb. Hook.*) July–Aug.—Root a slender woody rhizoma, producing numerous rigid stems, 6–12 inches high, sometimes a little woody at the base. Leaves 1–2 inches long, 5–9 lines wide, equally canescent both sides, velvety when young, less white and somewhat scabrous when older, conspicuously triplinerved, and more or less reticulate-veined; the upper obscurely serrate or entire. Racemes very dense, aggregated in a close panicle, at length more or less spreading and secund. Bracts linear. Exte-

rior scales of the involucre somewhat pubescent or ciliate.—The plant which we have, with some hesitation, considered a variety of this species, has narrower and less velvety-canescent leaves, more acute, looser racemes, &c. The species would probably be sought for among the *Triplinerviæ*; but we have retained it in this subdivision on account of its close alliance to the adjacent species.

* * * * * * *Racemes spreading or recurved* (*scorpioid*), *secund: leaves manifestly triplinerved or 3-ribbed.*—Triplinerviæ.

† Heads middle-sized: scales of the involucre rather thick and rigid, closely imbricated, with greenish tips.

60. *S. Shortii:* stem simple or branching from the base, minutely scabrous-pubescent; leaves rigid, smooth and glabrous, with ciliolate-scabrous margins, oblong-lanceolate, acute; the lower tapering to the base, sharply and unequally serrate towards the apex; the uppermost entire; racemes short, disposed in an elongated crowded panicle; scales of the involucre linear-oblong; achenia silky-pubescent.

β. heads disposed in a somewhat simple glomerate-spicate raceme.

γ. lower leaves slightly serrate, the upper entire.

Rocky islands at the Falls of the Ohio, *Dr. Short!* (*a.* & γ.) Kentucky? *Herb. Rafinesque!* (β. & γ.) July–Aug.—A very distinct species, 1–2 feet high, with the inflorescence and somewhat the habit of S. nemoralis; but with larger heads, and very smooth and somewhat shining acute leaves, the margins of which are mostly beset with small and rigid inflexed ciliæ; the lower 2–3 inches long, strongly triplinerved, and somewhat reticulate-veined; the uppermost commonly veinless. Racemes numerous, rather dense, secund, at length spreading, forming an erect or decurved more or less contracted panicle, 3–8 inches in length, which is often leafy at the base. Ray and disk-flowers each 5–7.

61. *S. Missouriensis* (Nutt.): smooth and glabrous; stem low, simple; leaves rigid, linear-lanceolate, acute, with very scabrous margins; the lower tapering to the base, sharply and sparsely serrulate (or even laciniate-serrate) towards the apex; the radical oblong-spatulate, petioled, 3–5-nerved, reticulated; racemes rather dense, slender, at length recurved-spreading, forming a short and crowded pyramidal panicle; scales of the involucre oblong, obtuse; achenia slightly pubescent.—*Nutt.! in jour. acad. Philad.* 7. *p.* 32, *& trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 327. S. serotina, *Hook.! in compan. to bot. mag.* 1. *p.* 97. S. glaberrima, *Martens, in acad. Brux.?* (we have seen no character), founded on a plant collected in Missouri by *Duerinck.*

β. leaves shorter and wider, less pointed.

γ. leaves more slender; stem corymbose at the summit; achenia glabrous.

Dry prairies of the Assiniboin (*Douglas!*) and the sources of St. Peter's River (*Mr. Nicollet!*) of the Upper Missouri (*Mr. Wyeth!*) to St. Louis, *Drummond!* Illinois, *Mr. Buckley!* Louisiana and Arkansas, *Dr. Pitcher! Dr. Leavenworth!* (Also Chapel Hill, North Carolina, according to Nuttall; but we apprehend some mistake.) β. Texas, *Drummond!* γ. Illinois, *Mr. Buckley!* July–Aug.—Stem a foot or more in height, from a somewhat ligneous caudex, simple, or sometimes fastigiately branched at the summit. Leaves crowded, often fascicled in the upper axils, coriaceous, shining, perfectly smooth, except the densely ciliolate-scabrous margins; the uppermost entire and scarcely if at all nerved; the others varying from obscurely appressed-serrulate to sparsely laciniate-toothed, conspicuously triplinerved when old, with the veins of the lower surface also somewhat parallel (the veinlets minutely reticulated), 2–3 inches long, 2–4 (in β. sometimes half an inch) in width. Racemes at first nearly erect, at length elongated and re-

curved, forming a short and broad panicle. Involucre closely imbricated. Rays 6–10, rather short.—A well marked species. The plant is sweet-scented, according to Mr. Buckley.

† † Heads small: scales of the involucre narrow, membranaceous: racemes mostly elongated, forming an ample panicle.

62. *S. Leavenworthii:* stem strict, scabrous; leaves linear, acute, sharply serrate, with ciliolate-scabrous margins, inconspicuously triplinerved, smooth and glabrous; racemes loose, recurved-spreading, somewhat secund, forming an elongated open panicle; peduncles villous-pubescent; (heads large for this subdivision;) scales of the involucre linear-oblong, very obtuse; rays small.

Florida, near Micanopy, &c., *Dr. Leavenworth!* Sept.–Oct.—Stem apparently 3 or 4 feet high, terete, simple, puberulent-scabrous throughout. Leaves numerous, about 3 inches long, and one-fourth of an inch wide, serrate with small and sharp appressed teeth, entire and somewhat narrowed near the base, with a conspicuous midrib, from which arise two rather obscure lateral nerves, veinless except by transmitted light, when they appear minutely reticulated under a lens. Racemes in a simple or compound somewhat leafy panicle (6–12 inches long), loose; the pedicels slender. Heads fully as large as in S. gigantea, and much less crowded. Rays about 12, small and slender; the disk-flowers nearly the same number. Ovaries minutely pubescent.—Allied in some respects to the S. odora group.

63. *S. elongata* (Nutt.): stem smooth or minutely pubescent, strict; leaves lanceolate, acute or acuminate at each end, sparingly serrate, nearly glabrous, obscurely triplinerved (the veinlets reticulated); panicle elongated, virgate or narrowly pyramidal; the racemes at length somewhat spreading and secund; scales of the involucre linear-subulate; rays small and slender; achenia pubescent.—*Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 327. S. elata, *Hook.! fl. Bor.-Am.* 2. *p.* 5, not of *Soland.*

β. leaves lanceolate-linear, sharply and irregularly serrate; racemes strict, at length somewhat spreading, but scarcely secund; heads smaller.—S. Canadensis *β. Hook.! l. c.* S. stricta, *Less. in Linnæa*, 6. *p.* 502? (Leaves either smooth and very indistinctly triplinerved, or slightly scabrous with the nerves more evident: varies also with the leaves shorter, the panicle short and obtuse. S. Canadensis, *Hook. & Arn.! bot. Beechey*, *p.* 145.)

γ.? leaves larger, somewhat scabrous above, minutely pubescent beneath, sometimes nearly glabrous; panicle dense, pyramidal, the crowded racemes at length recurved-spreading, secund; heads larger.—S. elongata *β. Nutt.! l. c.* S. Canadensis, *Hook.! fl. Bor.-Am.* 2. *p.* 1, as to Arctic specimens.

Oregon and California (*α.* & *β.*), *Menzies! Beechey! Douglas! Nuttall!* *γ.* Fort Vancouver, *Nuttall! Mr. Garry!* Straits of Da Fuca, *Dr. Scouler!* Arctic America, from Slave Lake, *Drummond!* to Fort Franklin on the Mackenzie River, *Richardson!*—Plant 3–4 feet high, in *γ.* stout, but the Arctic specimens more dwarf. Panicle 5–10 inches long, strict and narrow, with the heads about as large as in S. Canadensis: in *γ.* the dense panicle is usually thyrsoid or broadly pyramidal, with the heads fully as large as in S. gigantea; it is perhaps a distinct species. Rays exserted, but slender and inconspicuous.—This species perhaps extends to extra-tropical South America; for to it (or to S. linearifolia, *DC.?*) we may probably refer a plant collected in Mendoza by the late Dr. Gillies, mentioned in *Hook. fl. Bor.-Am.* under S. lanceolata.

64. *S. Canadensis* (Linn., Ait.): stem scabrous-hirsute or villous; leaves lanceolate, acuminate, sharply serrate, sometimes almost entire, more or less pubescent beneath and scabrous above; panicle pyramidal or fastigiate, of

very numerous recurved racemes; heads small; rays very short; achenia pubescent.—*Linn. hort. Ups. p.* 259, & *spec.* 2. *p.* 878; *Ait.! Kew.* (*ed.* 1) 3. *p.* 210; *Wild. spec.* 3. *p.* 2055; *Pursh, fl.* 2. *p.* 535; *Ell.! sk.* 2. *p.* 369; *Hook.! fl. Bor.-Am.* 2. *p.* 1 (excl. *β.*); *Darlingt.! fl. Cest. p.* 455; *DC.! prodr.* 5. *p.* 330. S. nutans, *Desf.! cat.*; *DC.! l. c.* Virga-Aurea angustifolia, &c. *Pluk. alm. t.* 236, *f.* 1.—Varies with the leaves almost smooth and glabrous (closely approaching S. serotina); and from oblong-lanceolate to elongated linear-lanceolate (a state of the latter is S. longifolia, *Schrad.! hort. Gœtt.*, & *in DC.! prodr. l. c.*), from very sharply serrate to nearly entire.

β. intermedia: stem villous or densely cinereous-pubescent; leaves softly pubescent or tomentose beneath, scabrous above.—S. Canadensis *γ. Ait.! l. c.*; *Hook.! l. c.* S. procera, *Desf. cat.*; *DC. l. c.* ("Heads much smaller than in S. Canadensis"); *Wild. enum.?*

γ. procera: stem villous or scabrous-hirsute; leaves tomentose beneath, scabrous above, elongated lanceolate, sparingly serrate, or the upper entire; heads larger, with the rays rather longer.—S. procera, *Ait. l. c.*; *Ell.! sk.* 2. *p.* 369.—Varies with the leaves slightly pubescent, except along the nerves, and the stem scabrous-pubescent, or sometimes glabrous below.

δ. scabra: stem scabrous-hirsute or cinereous; leaves lanceolate or oblong-lanceolate, frequently entire, indistinctly triplinerved, more veiny and pubescent-tomentose or scabrous-pubescent beneath, very scabrous above; heads and rays as in var. *γ.*—S. scabra, *Muhl.! cat.*, & *fl. Lancastr. ined.* (where it is well characterized); *Willd. spec.* 3. *p.* 2059 (where it is so incorrectly described that it has not since been recognized); not of *DC.!*

Borders of thickets, fields, &c., common nearly throughout the United States! to Subarctic America! (Oregon, *Nuttall.*) *δ.* Pennsylvania! to Georgia! and west to Saskatchawan! Louisiana! and Texas! Aug.–Oct.—A polymorphous species, distinguished by its small heads, very inconspicuous rays, and pubescent or scabrous stem and leaves. Our var. *β.* passes into the succeeding form, from which it is only to be distinguished by the somewhat larger heads: the latter is scarcely distinguishable from S. scabra, *Muhl.*; which has shorter and usually broader leaves, often indistinctly triplinerved but somewhat rugosely veined.—This species appears to have been a long time cultivated in many European gardens, under the name of S. altissima.

65. *S. serotina* (Ait.): stem very smooth, often glaucous; leaves lanceolate, acuminate, serrate, glabrous except the veins beneath, the margins and usually the upper surface scabrous; panicle pyramidal, of numerous recurved racemes; peduncles roughish-pubescent; rays short; achenia at length nearly glabrous.—*Ait. Kew.* (*ed.* 1) 3. *p.* 211; *Muhl.! herb.*; *Hook.! l. c.* partly. S. gigantea, *Darlingt.! fl. Cest. p.* 455.

Borders of thickets and low grounds, Canada! and nearly throughout the United States! (Oregon, *Nuttall.*) Aug.–Oct.—Distinguished by its smooth and stout stem (4–8 feet high), while the leaves are more or less pubescent along the ribs beneath, with the upper surface scabrous, at least towards the margins. The leaves are usually less attenuate at the base than in S. gigantea, which some states very closely approach; and the heads and rays are commonly intermediate in size between that species and S. Canadensis. Achenia pubescent when young.

66. *S. gigantea* (Ait.): stem stout, smooth and often glaucous; leaves smooth and glabrous both sides, lanceolate, attenuate-acuminate, densely scabrous-ciliolate, very sharply serrate, except the narrowed base; panicle pyramidal, of numerous recurved racemes; peduncles pubescent or villous; (heads large for this subdivision) rays exserted; achenia pubescent.—*Ait.! Kew.* (*ed.* 1) 3. *p.* 211; *Hook.! fl. Bor.-Am.* 2. *p.* 2; *DC.! prodr.* 5. *p.* 331. S. serotina, *Willd. spec.* 3. *p.* 2056.—Varies, with the leaves broadly,

or narrowly lanceolate (the latter S. glabra, *Desf.! cat.*; *DC.! l. c.*), very coarsely, or finely and sparsely serrate (the latter S. serotina, *Hook.! l. c.* as to spec. from Oregon, &c.), sometimes with the lateral nerves less distinct (S. gigantea, *Willd.! l. c.*); the panicle large and crowded, or sometimes loose and elongated.

β. leaves varying from lanceolate to oval-lanceolate, narrowed at the base; the lateral nerves often indistinct; panicle dense, thyrsoid or fastigiate.—S. gigantea β. *Hook.! l. c.* S. Pitcheri, *Nutt.! in jour. acad. Philad.* 7. *p.* 101, & *in trans. Amer. phil. soc. l. c.*

Fields and borders of thickets, Canada! and Saskatchawan! to Alabama! and west to Oregon! Common in the Northern and Western States. β. Arkansas, (*Dr. Pitcher!*) Kentucky! &c., to Saskatchawan! and Oregon! Aug.–Sept.—Distinguished by its perfectly smooth leaves as well as stem, (the latter 3 to 7 feet high), and larger heads with more conspicuous rays than any of its immediate allies.

67. *S. rupestris* (Raf.): stem slender, often loosely branched above, smooth, the branches and peduncles pubescent; leaves smooth and glabrous, linear-lanceolate, attenuate at both ends, entire or sparsely serrulate; panicle virgate; heads small; rays very short; achenia pubescent.—*Raf.! ann. nat.* (1820) *p.* 14.

Cliffs of Kentucky River, *Rafinesque! Dr. Short!* and apparently common in Kentucky! Indiana! &c. Aug.–Sept.—Smooth like S. gigantea, with the small heads and inconspicuous rays of S. Canadensis; remarkable for its nearly entire narrow leaves, somewhat resembling those of S. odora, but triplinerved (the nerves whitish), and for the slender and often simple racemose panicles which terminate the stem or loose branches. Stem 2–3 feet high.

§ 3. *Frutescent, branched, somewhat glutinous: leaves obscurely triplinerved, veinless, entire: heads corymbose-paniculate: involucre as in* § Virgaurea, *few-* (4–7-) *flowered: rays* 1–3.—CHRYSOMA, Nutt. (*in jour. acad. Philad., & trans. Amer. phil. soc.* excl. spec. 2 & 3.)

A specimen of a plant very nearly allied to the following, from the Bahama Islands, exists in Sir William Hooker's herbarium, chiefly differing in its smaller and mostly 4-flowered heads, short rays, and more evidently triplinerved leaves, which do not exhibit the beautiful reticulated structure of that species: it is very probably the S. Domingensis, *Spreng.* This section is allied to the *Maritimæ* on the one hand, (and is composed of sea-side plants?) and to Euthamia on the other.

68. *S. pauciflosculosa* (Michx.): glabrous or glaucous, the paniculate branchlets somewhat viscid; leaves thick, lanceolate, oblanceolate, or linear, obtuse, entire, narrowed at the base, sessile; branches of the compound panicle erect; scales of the 5–7-flowered involucre narrowly oblong, carinate; rays large; achenia silky-villous.—*Michx.! fl.* 2. *p.* 116. Chrysoma solidaginoides, *Nutt.! in jour. acad. Philad.* 7. *p.* 67.

In sand on the coast of Carolina (*Michaux!*) Georgia, *Mr. Croom!* Florida, *Mr. Ware! Dr. Leavenworth! Dr. Ingalls! Dr. Chapman!* and Alabama, *Mr. A. Bigelow!*—Stems woody, much branched, 1–3 feet high. Leaves 1–2 inches long, 1-nerved, or often obscurely triplinerved, veinless, appearing reticulate-punctate, or rather cancellate, by transmitted light. Heads rather large, somewhat clustered. Rays large, deep yellow. Pappus unequal, turning somewhat brownish.—This remarkable plant was doubtless unknown to Pursh, who has probably at a mere venture given it as a native of Virginia.

§ 4. *Herbaceous, much branched, fastigiate-corymbose: scales of the involucre much appressed, somewhat glutinous: receptacle fimbrillate: rays* (6–20) *more numerous than the disk-flowers, very small: achenia oblong, villous-pubescent: heads in corymbose clusters, mostly fascicled: leaves linear, entire,* 1–5-*nerved, sessile.*—EUTHAMIA, Nutt.

69. *S. lanceolata* (Linn.): stem much branched, fastigiate; the branches (at least the angles), with the nerves and margins of the lanceolate-linear 3–5-nerved leaves minutely scabrous-pubescent; heads obovoid-cylindrical, in dense corymbose clusters, sessile; scales of the involucre obtuse, oblong or lanceolate, the innermost linear; flowers of the disk 8–12; the minute rays 15–20.—*Linn.! mant. p.* 114; *Ait.! Kew.* (*ed.* 1) 3. *p.* 214; *Michx.! fl.* 2. *p.* 116 (*a.* major); *Pursh, fl.* 2. *p.* 405; *Bigel. fl. Bost. ed.* 2. *p.* 301; *Hook.! fl. Bor.-Am.* 2. *p.* 6 (partly); *Darlingt.! fl. Cest. p.* 461. S. graminifolia, *Ell.! sk.* 2. *p.* 391; *DC.! prodr.* 5. *p.* 341. Euthamia graminifolia, *Nutt.! gen.* 2. *p.* 162, & *in trans. Amer. phil. soc. l. c.* Chrysocoma graminifolia, *Linn. spec.* 2. *p.* 841.

Fields and borders of thickets, Canada! (from Subarctic America) and nearly throughout the United States. Aug.–Oct.—Stem 2–4 feet high, striate-angled, usually scabrous-puberulent. Leaves sometimes broadly lanceolate-linear (3–5 inches long) and 5-nerved (the lateral nerves more slender), sometimes narrow and indistinctly 3-nerved, numerous, but not fascicled in the axils. Heads one-fourth to one-third of an inch in length. Receptacle setose-fimbrillate.

70. *S. tenuifolia* (Pursh): glabrous or slightly scabrous; stem much branched, fastigiate; leaves very narrowly linear, spreading, 1- (rarely somewhat 3-) nerved, punctate with resinous dots; heads obovoid or turbinate, in loose corymbose clusters, mostly in glomerules of 2 or 3, sometimes pedicellate; rays 6–12, slightly exserted; the disk-flowers 5–6.—*Pursh, fl.* 2. *p.* 540; *Ell.! sk.* 2. *p.* 392; *DC. prodr.* 5. *p.* 341. S. lanceolata *β.* minor, *Michx.! l. c.* Euthamia tenuifolia, *Nutt.! l. c.*

Sandy fields, &c. from the coast of Massachusetts! and New York! to Florida! and Louisiana! Aug.–Oct.—A more slender plant than the preceding, with the heads smaller, and less glomerate. Leaves 1 to nearly 3 inches long, one line or less in width, sprinkled with resinous atoms, often fascicled in the axils. When the corymb is reduced to few heads, these are commonly pedicellate. The species is variable, and some states nearly approach S. lanceolata.

71. *S. leptocephala:* very smooth; stem densely fastigiate-corymbose at the summit; leaves lanceolate-linear, 1-nerved, or obscurely 3-nerved; heads narrow, cylindrical-clavate, in compound corymbose clusters, mostly fascicled and sessile at the apex of the peduncles; scales of the involucre linear; rays 8–10, very small; the disk-flowers 3 or 4.

Western Louisiana, *Dr. Leavenworth! Dr. Hale!* Texas, *Drummond!*—Stem apparently strict and nearly simple, except at the summit. Leaves crowded, but not fascicled, 2–3 inches long, 2–3 lines wide, with a strong midrib and usually 2 obscure lateral nerves, pellucid-punctate, as in the allied species, but not sprinkled with resinous atoms, not glutinous. Heads very numerous and slender. Rays mostly shorter than the disk-flowers. Receptacle conical, fimbrillate.

72. *S. occidentalis* (Nutt. under Euthamia): very smooth, loosely branched, somewhat paniculate; leaves narrowly lanceolate-linear, obscurely 3-nerved; heads in small corymbose clusters, pedicellate; scales of the many-flowered involucre linear-lanceolate, acute.—S. lanceolata, *Cham.* &

Schlecht.! in Linnæa, 6. *p.* 502; *Hook.! fl. Bor.-Am.* 2. *p.* 6, partly. Euthamia occidentale, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 326.

Oregon, *Dr. Scouler! Douglas! Nuttall!* and California, *Chamisso!* to the Rocky Mountains, *Nuttall*.—More paniculately branched than any other species of this division; the long and slender branches terminated by small clusters; the short and broadish heads all, or nearly all pedicellate: rays 16–20, a little exserted; the disk-flowers 8–14: appendages of the style of the latter obtuse. Receptacle with the margins of the alveoli pilose, rather than fimbrillate.

‡ *Species not sufficiently known to us, founded on native specimens.*

73. *S. decemflora* (DC.): stem erect, terete, and (with the leaves) somewhat scabrous with a very short pubescence; leaves oblong, mucronulate, entire, somewhat triplinerved; the radical attenuate at the base; racemes somewhat secund, disposed in a corymbose panicle; scales of the glabrous involucre linear; heads 10-flowered; the rays 5, very minute; achenia silky-villous. *DC. prodr.* 5. *p.* 322.

Texas, in the eastern districts, *Berlandier*. Plant a foot high. *DC.*—Perhaps it belongs to the corymbose division.

74. *S. rotundifolia* (DC.): stem erect, terete, puberulent, scabrous; leaves oval, ovate, or obovate, obtuse, mucronate, the margins and both surfaces very scabrous; the lower crenate, the upper entire; racemes erect, compact, short, disposed in a narrow panicle; bracts roundish; scales of the involucre glabrous, somewhat acute; rays very small. *DC. prodr.* 5. *p.* 332.

Texas, in the eastern districts, *Berlandier*.—Very distinct in the form of its bracts. *DC.*

75. *S. lepida* (DC.): stem erect, strict, terete, puberulent; leaves oval-lanceolate, with a long cuneate entire base, coarsely serrate at the apex, acuminate, feather-veined, somewhat scabrous, especially the margins and the veins beneath; panicle erect, terminal; scales of the glabrous involucre linear, acuminate; rays a little longer than the disk. *DC. prodr.* 5. *p.* 339.

β. subserrata (DC. l. c.): leaves slightly serrate.

Nootka, *Hænke*.—Allied to S. latifolia and S. ambigua. *DC.*

76. *S. compacta* (Turcz.): racemes erect; stem ascending, strict, scabrous; leaves oblong-lanceolate, tapering into a long petiole, entire, or the uppermost serrulate, slightly scabrous, the margins ciliate; heads densely glomerate, surrounded by leaves.—*Turcz. in bull. soc. nat. Mosc.* 1840. *p.* 73.

Unalaschka, *Turczaninow*.—Perhaps the same as S. lepida, *DC.*

77. *S. elata* (Pursh): stem hairy, terete; leaves lanceolate, somewhat hairy beneath; racemes erect; rays elongated. *Pursh, fl.* 2. *p.* 543.

North America, (*Herb. Banks.*) *Pursh*.—Two plants are ticketed 'S. elata' in the Banksian herbarium: one, a cultivated specimen of a maritime species, is S. integrifolia, *Desf. & DC.*: the other is marked 'New Jersey, *Bartram*'; and has a hairy stem, corymbosely branched above; elliptic serrate leaves, which are hairy on both surfaces and ciliate; erect racemes; rather rigid and minutely strigose-canescent scales of the involucre (the outermost ovate, short; the inner oblong-lanceolate, slightly pointed, all somewhat carinate); and strigose-canescent achenia. Dr. Boott has remarked its great similarity to "S. Narbonensis, *Pourret, in act. Tolos.* 3. *p.* 329" (of which we have seen no description), from which we suspect it is not distinct.

78. *S. pauciflora* (Raf.): stem simple, smooth; leaves oblong-lanceolate, acute, entire; flowers 1–5, terminal.—*Raf. in med. repos.* (*hex.* 2) 5. *p.* 359.

Gloucester County, New Jersey, and Kent County, Delaware, *Rafinesque*.

‡ ‡ *Species founded on garden specimens (many of unknown or uncertain origin), which we have not identified with native plants.*

* *Racemes erect.*

79. *S. grandiflora* (Desf.): clothed with a short and close villous pubescence, somewhat scabrous; leaves elliptical or oblong-lanceolate, finely serrate, acute; the lower narrowed at the base; racemes paniculate, forming a thyrsus; heads 30–40-flowered; scales of the involucre oblong, obtuse, pubescent; rays (large) 8–10; achenia pubescent.—*Desf.! cat. hort. Par. ed.* 3. *p.* 403; *DC.! prodr.* 5. *p.* 337.

North America? the particular origin unknown; cultivated in the Garden of Plants, Paris.—We have seen no indigenous specimens of this species; which has much the aspect of S. rigida, and its heads are nearly the same size; but the rather loose racemes are paniculate, the upper shorter and with few heads, so that the inflorescence forms a pyramidal thyrsus or panicle instead of a fastigiate corymb; the scales of the involucre are narrower and less obtuse; the achenia clothed with a minute pubescence; even the upper leaves are serrulate, and the radical (which we have not seen) are said to be scarcely petioled.

80. *S. multiflora* (Desf.): stem erect, glabrous, terete, very much branched, the paniculate branches sparsely pubescent; leaves sessile, lanceolate, acuminate, serrate, glabrous, or the uppermost somewhat pubescent along the nerves; racemes erect; scales of the involucre glabrous, acute; rays rather longer than the disk. *DC.—Desf.! cat. hort. Par. ed.* 1804, *p.* 103, & *ed.* 3. *p.* 402; *Pers. syn.* 2. *p.* 449; *DC.! prodr.* 5. *p.* 336.

Said to be of North American origin; but we have seen no native specimens which accord with the cultivated plant. The heads resemble S. Canadensis, but the racemes are very short, in erect panicles. Achenia pubescent. Leaves somewhat scabrous above; the upper slightly triplinerved, the midrib pubescent.

81. *S. fuscata* (Desf.): very glabrous; stem erect, brownish-red, smooth [terete]; leaves lanceolate, quite entire; racemes erect; pedicels short, bracteolate; scales of the involucre oblong, glabrous, scarcely acute; rays 5–6, linear, a little longer than the disk; the disk-flowers 6–7. *DC.*—"*Desf.! cat. hort. Par. ed.* 3. *p.* 402"; *DC.! prodr.* 5. *p.* 340.

North America?—Unknown to us as a native plant. The leaves are not unlike S. speciosa.

82. *S. plantaginea* (Desf.): glabrous; stem angled; leaves triplinerved, slightly serrulate, acute, narrowed towards the base; the lower ovate; floriferous branches erect, leafy. *Desf. cat. l. c. p.* 402.

Cultivated in the Paris Garden; probably of American origin.—Very glabrous: stem 3–4 feet high. Flower-branches panicled; the partial racemes of few small heads. Pedicels with subulate bracts. *Desf.*—This is referred by De Candolle to his S. elliptica.

83. *S. hirta* (Willd.): stem paniculate, hirsute; leaves lanceolate, scabrous on both sides; the cauline serrate, those of the branches entire; racemes erect; rays elongated. *Willd. enum. p.* 891.

North America.—Sufficiently distinguished by its hirsute stem, and scabrous leaves; the cauline deeply and sharply serrate. *Willdenow.*—It has never been identified in this country.

84. *S. lithospermifolia* (Willd.): stem branching, pubescent; leaves lanceolate, attenuate, scabrous on both sides, triplinerved, entire; racemes erect; rays elongated. *Willd. enum. p.* 892; *Link, enum.* 2. *p.* 332; *DC. prodr.* 5. *p.* 339.

North America, *Willdenow.*—Leaves nearly as in Lithospermum officinale. *Willd. l. c.*—Cauline leaves long, triplinerved, scabrous. Flowers rather large. *Link.*—Stem pubescent, somewhat hispid. Leaves apiculate with a callous mucronation, somewhat triplinerved, the lateral veins minute. *DC.*—Pursh, who professes to have seen this species growing, gives the habitat, Sandy barren woods, New Jersey to Carolina; but affords no other information.

85. *S. gracilis* (Poir.): stem erect, glabrous, somewhat simple; leaves lanceolate, acuminate, serrate, glabrous, ciliolate, feather-veined; the lower oval-lanceolate, attenuate at the base; the uppermost nearly entire; racemes erect, bearing few heads disposed in a narrow panicle; scales of the involucre scarcely acute; flowers 9; those of the ray nearly twice the length of the disk. *DC.—Poir. dict.* 8. *p.* 476? (where the leaves are said to be entire) *DC. pl. rar. hort. Genev.* 6. *p.* 6, *& prodr.* 5. *p.* 336.

North America?—The plant is said to be a foot and a half high, with a reddish stem; the largest leaves 2 inches long, 6–8 lines wide; the branches terminated by erect panicles, 2–3 inches in length, less than an inch in breadth: the ovaries clothed with very small appressed hairs. The latter character, among others, would seem to separate the plant from S. stricta and S. linoides.

86. *S. Schraderi* (DC.): stem erect, terete, sparsely pubescent, paniculately branched; leaves linear-lanceolate, acuminate, serrate at the apex, glabrous, with somewhat scabrous margins, the uppermost entire; racemes erect, very short, bracteolate; scales of the involucre acute; rays linear, as long as the disk. *DC. prodr.* 5. *p.* 336. S. gracilis, *Schrad. hort. Gætt.*, fide *DC.*

A species of unknown (probably N. American) origin, allied to the preceding; but the leaves longer, narrower, and a little more rigid; the long paniculate branches bearing very short axillary racemes for a long distance; the rays much shorter, &c. *DC.*

87. *S. carinata* (Schrad. in DC.): stem erect, angled at the summit, somewhat puberulent; radical leaves on long petioles, oblong, tapering at the base, obtuse at the apex, mucronate, sinuate-serrate; the upper sessile, linear, somewhat serrate; all glabrous, with the margins scabrous, the midrib prominent beneath; racemes erect, disposed in a panicle; rays 7–9, longer than the disk. *DC. prodr.* 5. *p.* 337.

Cultivated in the Gœttingen Botanic Garden, the origin unknown, perhaps North American.—Radical leaves 7 inches long, including the petiole, 8–10 lines broad. Pedicels puberulent, bracteolate. *DC.*—Perhaps a cultivated state of S. stricta.

88. *S. mollis* (Bartl.): leaves, as well as the terete stem, pulverulent-pubescent, with scabrous margins, obovate-oblong, serrate above; the floral ones oblong, entire; racemes erect, panicled; scales of the involucre appressed, acute, glabrous; rays longer than the disk. *Bartl. ind. sem. hort. Gætt.* 1836, *p.* 5, *& in Linnæa*, 12. *suppl. p.* 80; *DC. prodr.* 7. *p.* 279.

North America; raised from seed collected by Prince Neu-wied.—May it be a state of S. nemoralis?

* * *Racemes spreading or recurved, secund.*

89. *S. verrucosa* (Schrad.): stem verrucose, glabrous, erect, the summit reflexed; leaves ovate-lanceolate, acute, serrate, glabrous, the upper narrower; racemes axillary, as long as the leaves, compound, the summit reflexed; rays elliptical. "*Schrad. hort. Gætt. p.* 12. *t.* 6, *& in neu. jour.* 1810, *p.* 140; ex *DC. prodr.* 5. *p.* 334.

North America: said to be allied to S. arguta and S. elliptica. *DC.*—This is perhaps our S. neglecta: but we have never observed a verrucose stem in that species.

90. *S. recurvata* (Willd.): stem erect, pubescent; leaves lanceolate, acuminate (veiny), serrate, nearly glabrous, the margins scabrous; racemes elongated, secund, panicled. *Willd. enum. p.* 889; *DC. prodr.* 5. *p.* 334.

North America, *Willdenow.*—Described from a plant cultivated in the Berlin Botanic Garden.—Leaves glabrous above, slightly scabrous along the nerves beneath. Rays linear-oblong, a little longer than the disk. *DC.*—Pursh is the only American author who pretends to have recognized this species, which he gives as a native of shady woods of Pennsylvania and Virginia.

91. *S. lateriflora* (Linn.): panicle corymbose; racemes recurved, ascending; stem bearing flower-branches below the middle. *Linn. spec.* 2. *p.* 879.

North America, *Kalm.*—The plant is said by Linnæus to be half the size of S. Canadensis; the leaves entire or with one or two teeth; the flowers as in S. altissima; the simple branches rather shorter than the stem, corymbose. As remarked by Smith, (*Rees, cycl.*) there is some doubt as to the plant Linnæus had in view, which an inspection of his herbarium does not remove. The plant cultivated under this name appears to have been much changed by long cultivation. As described in the Hortus Kewensis, it is said to have an erect somewhat hairy stem, lanceolate somewhat triplinerved glabrous leaves with scabrous margins, the lower somewhat serrate, and the paniculate racemes secund and somewhat recurved. According to Willdenow (*enum. p.* 889), when cultivated in a shady place, the stem is very simple, with simple axillary racemes, the lower very long, the upper short: but in exposed situations the stem becomes branched.

92. *S. fragrans* (Willd.): stem erect, glabrous; leaves glabrous, oblong, attenuate at each end, slightly triplinerved; the lower somewhat serrate, the upper entire; racemes more or less secund; pedicels pubescent; bracts linear-subulate, arcuate-recurved; scales of the involucre somewhat greenish [ovate-lanceolate, acutish]; rays oblong, rather longer than the disk [achenia silky-villous]. *DC.—Willd. enum. suppl. p.* 59, ex *Link, enum.* 2. *p.* 331; *DC.! prodr.* 5. *p.* 331.

North America, *Willd.*—We have seen no native plant which accords with our specimens of this species, gathered in the Berlin Botanic Garden. It is perhaps a maritime species; and the leaves (which are rather thick, dark green, and shining above, 2–3 inches long, about half an inch wide, minutely veiny,) are scarcely sufficiently 3-ribbed to give it a place among the *Triplinerviæ*. The racemes are mostly axillary, rather crowded, and scarcely longer than the leaves; the heads fully middle-sized; the exterior scales of the involucre greenish: and the achenia clothed with white appressed hairs.

93. *S. dubia* (Scopoli): stem erect, striated, slightly hairy; leaves lanceolate, smooth, distantly toothed; clusters panicled, unilateral, rather hairy, the lower ones axillary; bracts lanceolate, smooth. *Smith.—Scopoli, del. insubr.* 2. *p.* 19, *t.* 10; *Smith, in Rees, cycl. no.* 23. S. Cleliæ, *DC. prodr.* 5. *p.* 331.

Cultivated in the Italian gardens, (collected by Smith in the garden at Pavia, in 1787; and by De Candolle in that of Clel. Grimaldi near Genoa, in 1808,) and supposed to be of North American origin. According to Smith, Dryander "considered it as coming nearest to S. elliptica; but its leaves are narrower, and its bracteas much less. Most of the clusters are axillary, composing a leafy panicle, and about as long as their corresponding leaves.

Rays rather numerous. The foliage is rigid, entirely smooth, finely toothed, not serrated, somewhat triple-ribbed, indeed more so than in S. lateriflora, next to which species we should have placed it but for its alleged affinity to S. elliptica." *Smith, l. c.*

94. *S. reflexa* (Ait.): stem erect, villous; leaves lanceolate, somewhat serrate, triplinerved, scabrous, reflexed; racemes paniculate, somewhat secund. *Ait. Kew.* (*ed.* 1) 3. *p.* 211; *Willd. spec.* 3. *p.* 2057 (who adds: Leaves narrowly lanceolate, acuminate, with about three serratures in the middle, scabrous, reflexed; branches of the panicle secund, reflexed, short). *DC.! prodr.* 5. *p.* 330.

This is unknown to us as a wild plant, nor can we identify the one or two different species which are cultivated in Europe under this name with any indigenous species. Pursh's habitat, "Pine woods and old fields, New Jersey to Carolina," is probably of no account; and the species was not recognized by Elliott. The plant of De Candolle (Geneva Bot. Garden) has a very much contracted and simple erect panicle, with the heads rather larger than in S. Canadensis; the stem somewhat pubescent above; the narrowly lanceolate leaves slightly pubescent beneath, obscurely triplinerved.

S. Noveboracensis, Linn. (the particular derivation of the specimen unknown), the ray-flowers of which probably were not yellow, is apparently an Aster, with heads as large as those of A. patens.

S. asperula, of Desf. cat. l. c., the native country of which is not mentioned, by no means corresponds with the plant received by De Candolle under this name, which he considers a doubtful and probably monstrous state of S. rigida: but the species described by Desfontaines is said to have elongated and spreading racemes, with small secund heads.

40. BIGELOVIA. (Bigelowia,*) *DC. prodr.* 5. *p.* 329 (excl. § 2 & 3), & *mem. Comp. t.* 5; not of *Smith*, of *Spreng.*, nor of *Raf.*

Heads 3–4-flowered; the flowers all perfect and tubular. Involucre clavate-cylindrical, somewhat colored, as long as the flowers; the scales (10–14) linear, imbricated, appressed, rigid, somewhat glutinous. Receptacle narrow, pointed by a hyaline or scale-like cusp as long as the achenia. Corolla, anthers, and style nearly as in Linosyris; the latter scarcely exserted. Achenia somewhat obconic, hairy. Pappus a single series of scabrous capillary bristles.—A perennial glabrous herb, with slender stems, simple or branched from the base, somewhat naked above, corymbose at the summit. Leaves alternate, oblanceolate or linear, entire, 1–3-nerved, obscurely punctate. Heads in a fastigiate corymb or cyme. Flowers yellow, the involucre also yellowish.

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* "A Chrysocoma separatum dicavi cl. *J. Bigelow*, qui floræ Americanæ auream coronam flora Bostoniensi et medica addidit." *DC. l. c.*—We gladly retain the name of Bigelovia for this genus (excluding the species wrongly associated with it); since the Bigelovia of *Spreng. syst.*, if sufficiently distinct from Spermacoce. will keep that of Borreria so long as the Borrera of Acharius is merged in Parmelia, &c. But if both the above-mentioned genera prove distinct, the name Borrera, *Achar.* must be preserved in the Lichens, and that of Bigelovia, *Spreng.*, *Arn. &c.* in Rubiaceæ; in which case the present genus may be called *Aciclinium.*

B. nudata (DC.! l. c.)—Chrysocoma nudata, *Michx.! fl.* 2. *p.* 101; *Pursh! fl.* 2. *p.* 517; *Ell.! sk.* 2. *p.* 309.

a. spathulæfolia: radical and lower leaves oblanceolate, 1- or obscurely 3-nerved, tapering into an attenuated base; the cauline ones scattered, often very few, linear.—B. nudata, *DC.! l. c., & mem. comp. t.* 5. Chrysocoma nudata, *Nutt. gen.* 2. *p.* 137.

β. virgata: earliest radical leaves linear-spatulate; the others, and the (often more numerous) cauline ones narrowly linear, 1-nerved.—B. virgata, *DC.! l. c.* Chrysocoma virgata, *Nutt. l. c.*

Borders of swamps, and low pine barrens, New Jersey (*Nuttall*) and Virginia! to Florida! Alabama! Louisiana! and Texas! Aug.–Oct.—Stems 1–2 feet high, slender. Lower leaves 2–3 inches long; the uppermost very short, scattered. Scales of the involucre 1-nerved, with somewhat greenish tips.—The habit is much that of the section Euthamia in Solidago, but the stems are less inclined to branch. The B. virgata appears to be only a narrow-leaved state of the ordinary plant; but it may, perhaps, be a distinct species.

41. LINOSYRIS. *Lobel; DC. prodr.* 5. *p.* 351, (& Bigelowia § 2. *DC.*)

Linosyris & Crinitaria, *Cass.*—Chrysothamnus, *Nutt.*

Heads 5–many-flowered; the flowers all perfect and tubular. Involucre campanulate, obovoid, or oblong, often shorter than the disk; the scales imbricated, mostly concave or carinate, destitute of herbaceous tips; the exterior usually looser and bracteolate, passing into the leaves. Receptacle flat, alveolate-toothed; the teeth fleshy or somewhat lacerate. Corolla with an expanding 5-cleft or 5-parted limb. Branches of the style with flat linear or oblong stigmatic portions; the pubescent appendages various in form. Achenia oblong, somewhat compressed, silky-villous. Pappus simple, of copious scabrous capillary bristles.—Perennial herbs or suffruticose plants (natives chiefly of Southern Europe, Northern Asia, and North America west of the Mississippi), branched from the base, and bearing corymbose heads at the summit. Leaves alternate, crowded, sessile, linear or oblong, mostly entire, and 1-nerved. Flowers yellow.

§ 1. *Involucre* 20–30-*flowered, as long as the disk.*

1. *L. Texana:* suffrutescent at the base, glabrous, not glutinous; stems and numerous branches strongly striate-angled; leaves linear, carinately 1-nerved, rather rigid; scales of the hemispherical involucre lanceolate, acute, loosely imbricated in 2 or 3 series; lobes of the deeply parted limb of the corolla lanceolate-linear, as long as the tube; appendages of the style lanceolate, thicker than the stigmatic portion, and about its length; pappus as long as the flowers.

Texas, *Drummond! Dr. Riddell!*—Stems 1–2 feet high, much branched at the summit. Leaves 1–2 inches long, less than 2 lines wide, acute, sometimes with 2 slight undulate lateral nerves, and very minutely and obscurely dotted. Heads all more or less pedicellate, with few bracteal leaves. Scales of the involucre smooth, not rigid, strongly 1-nerved, with slight scarious margins, obscurely ciliate near the apex. Receptacle alveolate-toothed; the teeth somewhat fleshy. Pappus not very copious, very soft and slender. Achenia unknown.

This is Bigelowia Texana, Gray Pl. Wright.

2. *L. Drummondii:* much branched from the suffrutescent base, glabrous, the young heads and fastigiate branchlets somewhat glutinous; stems terete; leaves narrowly linear, tapering to the base, thickish, obscurely 1-nerved; scales of the obovoid involucre closely imbricated in 4–5 series, rigid, lanceolate-oblong; the outermost passing into subulate bracts; corolla somewhat exceeding the pappus, the slender tube longer than the cyathiform 5-cleft limb; the triangular-lanceolate appendages of the style much shorter than the stigmatic portion.

Texas, *Drummond!*—Stems rigid, 8–10 inches high; the heads nearly sessile and somewhat aggregated at the extremity of short terete branchlets. Leaves an inch long and a line wide, crowded. Scales of the involucre either glutinous, or slightly pulverulent at the apex, obtusish. Stamens inserted below the middle of the tubular part of the corolla. Ovary silky-pubescent.—The achenia are immature.—Another species of this continent, L. Mexicana, is figured by Schlechtendal (*Hortus Halensis, t.* 4.), and is remarkable for its toothed leaves.

§ 2. *Involucre several-*(6–10–20-) *flowered, mostly shorter than the disk; the scales oval or oblong, concave or carinate: appendages of the style triangular or deltoid-ovate, much shorter than the flat stigmatic portion.*

This division includes the Siberian L. punctata, L. villosa, (in which the heads are only 8–10-flowered), L. Tartarica, &c.; in our specimens of the latter the heads are only 5–7-flowered.

3. *L. pluriflora:* frutescent? glabrous; branches angular; leaves very narrowly linear, somewhat attenuate towards the base, obscurely 1-nerved; heads 15–18-flowered, crowded and subsessile at the summit of the small nearly leafless branchlets, forming a compound fasciculate corymb; scales of the involucre smooth and shining, oblong-lanceolate, acute, closely imbricated, very unequal; lobes of the corolla very much shorter than the tube; appendages of the style lanceolate-ovate, obtusish.—Chrysocoma graveolens, *Torr.! in ann. lyc. New York,* 2. *p.* 211, not of *Nutt.*

Upper Missouri or Platte? *Dr. James!*—The lower part of the stem is wanting in our specimen. Leaves about 2 inches long, a line wide, obscurely impressed punctate, and a little resinous. Heads densely clustered, one-third of an inch long. Scales of the involucre small, coriaceous, with narrow scarious margins. Pappus copious, unequal. Alveoli of the receptacle lacerate-dentate.

4. *L. lanceolata:* shrubby, cinereous-puberulent; branches terete; leaves linear-lanceolate, mucronate, 3-nerved, with scabrous margins; heads 6–8-flowered, in clusters, forming a compound fastigiate corymb; scales of the involucre oval, obtuse, or abruptly somewhat acute, loosely imbricated in 3–4 series, the innermost glabrous, nearly the length of the disk; lobes of the corolla about half the length of the tubular portion; branches of the style elongated; the appendages lanceolate, acute.—Chrysothamnus lanceolatus, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 324.

Rocky Mountains, on the sources of the Platte, and of Lewis River, *Nuttall!*—"A moderate-sized shrub." Leaves 1–1½ inch long, 3–4 lines broad. Heads smaller than in the preceding.

§ 3. *Involucre 5-flowered, mostly shorter than the disk; the concave or carinate scales oval or oblong-linear: appendages of the style linear-subulate, longer than the linear flat stigmatic portion.*—Chrysothamnus, *Nutt.* (Bigelowia § 2. Spuriæ, *DC.*)

5. *L. graveolens:* shrubby, very much branched; branches pulverulent-tomentose, whitish; leaves very narrowly linear, 1-nerved, glabrous; heads (large) 5-flowered, clustered; scales of the involucre few, loosely imbricated in about 3 series, glabrous, carinate; the outermost very short, ovate-oblong; the innermost elongated, linear; pappus very fine and capillary; corolla glabrous.—Chrysocoma dracunculoides, *Pursh! fl.* 2. *p.* 517, excl. char., which chiefly relates to L. punctata. C. graveolens, *Nutt.! gen.* 2. *p.* 136. Bigelowia dracunculoides, *DC. prodr.* 5. *p.* 329. Chrysothamnus dracunculoides, *Nutt. in trans. Amer. phil soc. l. c. p.* 324.

β. leaves and the outermost scales of the involucre, as well as the branches, more or less tomentose-pubescent.—Chrysocoma nauseosa, *Pursh, l. c.?* Bigelowia Missouriensis, *DC. l. c.* Chrysothamnus speciosus, *Nutt.! in trans. Amer. phil. soc. l. c.* (excl. var. *β.*)

On the denudated banks of the Missouri, Platte, &c. *Lewis! Nuttall!* and plains in the Rocky Mountains, *Nuttall!* Aug.—Shrub 3–5 feet high, with a heavy and unpleasant, though somewhat aromatic odor; with numerous virgate branches, like the common Broom. Flowers abundant, brilliant yellow. *Nutt.*—Heads narrow, nearly half an inch long. Corolla a little longer than the fine and scarcely scabrous, unequal and copious pappus, slightly dilated upwards; the lobes about one-fifth the length of the undivided portion. Stamens inserted low down in the tube. Appendages of the style linear-subulate, longer than the stigmatic portion. Leaves 2–3 inches long, about a line wide.

6. *L. albicaulis:* stem and branches densely lanate-tomentose, white; leaves very narrowly linear, tomentose-pubescent (at length glabrous?), 1-nerved; tube of the corolla beset with very fine long villous hairs!—Chrysothamnus speciosus *β.* albicaulis, *Nutt. l. c.* Chrysocoma nauseosa, *Pursh, l. c.?*

Rocky Mountain plains near Lewis River &c., *Nuttall!*—Resembles the preceding very perfectly, except in the characters pointed out. Mr. Nuttall remarks that it is perhaps a distinct species; without noticing, however, the character upon which we should chiefly rely for distinguishing them; viz. the long cobwebby hairs of the corolla.

7. *L. viscidiflora* (Hook.): shrubby, glabrous; leaves narrowly linear, 1-nerved, rigid, very acute; heads more or less clustered, fastigiate-corymbose, 5-flowered; scales of the oblong involucre glabrous, often glutinous, oblong or oval, carinate-concave, few, rather loosely imbricated in about 3 series; the exterior very short; corolla glabrous.—*Hook. fl. Bor.-Am.* 2. *p.* 24, under Crinitaria. Bigelowia viscidiflora, *DC. prodr.* 7. *p.* 279.

β. "involucre ovate, the scales ovate and short."—Chrysothamnus pumilus *β.* enthamioides, *Nutt. l. c.*

γ. dwarf, much branched from the base, minutely pulverulent-pubescent or nearly smooth.—Chrysothamnus pumilus, *Nutt.! l. c.*

Barren plains of the Oregon, from the Great Falls to the Mountains, &c. *Douglas!* Lewis River and plains of the Rocky Mountains, *Nuttall!*—The plant described by Hooker is said to be a common shrub, 2–4 feet high, in the region where Mr. Nuttall obtained his Chrysothamnus pumilus: the latter is called a low shrub, about 6 inches high, and described as either glabrous or pulverulent-pubescent, with the involucre either smooth or glutinous; so that nothing of any consequence is left to distinguish it from Hooker's plant, of which we have seen no specimens. The heads are much smaller than in the preceding; the pappus of firmer hairs, and more scabrous; but the habit and structure of the plant nearly the same.

‡ *Doubtful Species.*

8. *L.? humilis* (Hook., under Crinitaria): branches sparsely and slightly

hirsute; leaves linear-lanceolate, denticulate-ciliate, mucronulate-acute; heads axillary and terminal; scales of the glabrous involucre linear; the exterior larger and foliaceous. *Hook. l. c.*

Banks of the Saskatchawan, *Drummond.*—Plant 3–4 inches high, of doubtful genus.

42. AMMODIA. *Nutt. in trans Amer. phil. soc.* (*n. ser.*) 7. *p.* 321.

Heads many-flowered; the flowers all perfect and tubular. Scales of the campanulate involucre scarious-membranaceous, linear or lanceolate, 1-nerved, imbricated in few series; the innermost as long as the disk, the outermost short, appressed. Receptacle flat, alveolate-toothed. Branches of the style subulate-filiform, the appendages longer than the flat stigmatic portion. Achenia oblong-linear, attenuate, fusiform, or somewhat compressed, pubescent. Pappus of copious minutely scabrous capillary bristles.—A perennial branching somewhat hairy herb, with the habit and appearance of Inula viscosa! exhaling a heavy odor. Leaves alternate, oblong, entire, veiny, sessile. Heads irregularly paniculate-corymbose: peduncles somewhat glandular; the pale yellow flowers nearly hid in the copious white pappus.

A. Oregana (Nutt.! l. c.)

On the sand and gravel bars of the Oregon and its tributaries, common, *Nuttall!* Aug.—Stems a foot high, many from the same root. Heads as large as in Inula viscosa. Flowers all similar; the corolla slender, slightly dilated upwards, 5-toothed. Anthers not caudate.

43. MACRONEMA. *Nutt. in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 322.

Heads many-flowered; the ray-flowers 6–8, ligulate, pistillate, or none; those of the disk tubular, perfect. Scales of the involucre, few, loose, somewhat in 2 series, nearly equal, linear-lanceolate, 1-nerved; the exterior mostly with foliaceous spreading tips, commonly with one or more foliaceous bracts at the base resembling the upper leaves. Receptacle flat, areolate. Corolla of the disk somewhat dilated above, 5-toothed. Branches of the style much exserted; the appendages of the style (in the disk-flowers) elongated, subulate, hirsute, much longer than the linear flat stigmatic portion. Achenia large, much compressed, when mature longer than the pappus of copious somewhat unequal scabrous capillary bristles.—Low and viscidly pubescent much branched shrubby plants (natives of Oregon); the fastigiate leafy branches terminated by solitary rather large heads. Leaves alternate, lanceolate, entire, sessile. Flowers yellow.

§ 1. *Heads radiate: achenia pubescent.*

1. *M. suffruticosa* (Nutt.! l. c.): leaves oblong-linear or lanceolate, acute, somewhat narrowed towards the base; scales of the involucre mostly appendiculate; achenia oblong or slightly obovate, flat, 1–3-nerved on each side.

Sandy and gravelly banks of the Malade, a stream of the Oregon, near

the Blue Mountains, *Nuttall!*—Stem 6–8 inches long, from a low woody base, leafy to the summit. Leaves an inch or more long, about 2 lines wide. Heads large, with about 30 disk-flowers and mostly 8 linear-oblong rays, "having often the same pubescent stigmas with the discal florets, and not unfrequently the rudiments of stamens." *Nutt.* Pappus ferruginous.—The heads are not unlike those of Dieteria (Pappochroma) coronopifolia.

§ 2. *Rays wanting: achenia very glabrous.* (EUGYMNA, *Nutt.*)

2. *M. discoidea* (Nutt.! l. c.): young branches tomentose; leaves subspatulate-oblong, obtuse; involucre subtended by 2–3 foliaceous linear-oblong bracts similar to the upper leaves; the inner scales membranaceous, scarious, not appendiculate; young achenia linear-oblong.

Banks of Lewis River and other tributaries of the Oregon, *Nuttall!*—Resembles the preceding. Leaves about an inch long, 2–3 lines wide. Heads 25-flowered.

44. ERICAMERIA. *Nutt. in trans. Amer. phil. soc. (n. ser.) 7. p. 318.*

Heads few-flowered; the ray-flowers 3–6, ligulate, pistillate; those of the disk 7–9, tubular, perfect. Scales of the turbinate or cylindrical involucre few, imbricated, carinate-concave, chartaceous with scarious margins; the outermost short and subulate, fleshy, passing into the leaves. Receptacle small, alveolate. Corolla with a slender tube; that of the disk infundibuliform at the summit, 5-toothed. Branches of the style linear-subulate, the hirsute acute appendages much longer than the stigmatic portion. Achenia linear, slender, terete, mostly glabrous. Pappus of copious capillary bristles, entirely similar but unequal.—Dwarf and often resinous shrubby plants (natives of Oregon & California), exceedingly branched and leafy, with the aspect of Heaths. Leaves acerose or linear-subulate, crowded and fascicled, persistent. Heads small, corymbose at the extremity of the branchlets. Flowers yellow.

1. *E. microphylla* (Nutt.! l. c.): somewhat pubescent, scarcely glutinous; leaves terete, obtuse, very short, much fascicled; rays 3–4; inner scales of the involucre oblong, obtuse; achenia glabrous.—Diplopappus ericoides, *Less., in Linnæa!* 6. *p.* 117. Aplopappus ericoides, *Hook. & Arn. bot. Beechey, p.* 146; *DC.! prodr.* 5. *p.* 346.

California, on rocks, *Chamisso! Douglas! Nuttall!* &c.—Shrub 6–12 inches high, at first cinereous-pubescent: the leaves 3–5 lines long, not unlike those of Adenostoma.

2. *E. nana* (Nutt.! l. c.): glabrous, somewhat glutinous; leaves linear-acerose, acute, channelled; rays about 4; scales of the involucre lanceolate, acute; achenia minutely hairy, somewhat compressed.

On shelving rocks in the Blue Mountains of Oregon, *Nuttall!*—Shrub scarcely a span high, densely branched, fastigiate, brittle: the rigid leaves 6–12 lines long. Pappus not very copious, in 2 series, somewhat deciduous.

3. *E. resinosa* (Nutt.! l. c.): glabrous, glutinous; branches slender, corymbose at the summit; leaves subulate-linear, acute, tapering to the base; rays about 6; the disk-flowers about 12; the limb of the corolla deeply 5-cleft; scales of the involucre lanceolate, acute; achenia hirsute when young.

With the preceding; the flowers larger and not perfectly yellow (ochroleucous); the branches more slender and open; the leaves somewhat longer and a little broader; the rays often, but not always bilabiate, with 2 strap-shaped narrow segments opposed to the 2-toothed ligule. *Nuttall.*—Pappus in a single series, the capillary bristles nearly all equal.

45. STENOTUS. *Nutt. in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 334.

Heads many-flowered; the ray-flowers 8–12, ligulate, rather distant, pistillate; those of the disk tubular, perfect. Scales of the hemispherical involucre few, oblong-ovate or orbicular, 1-nerved, membranaceous (rarely coriaceous) with scarious margins, closely appressed and regularly imbricated in 2–3 series. Receptacle flat, alveolate-toothed. Rays oval or oblong. Corolla of the disk dilated towards the summit, deeply 5-toothed. Appendages of the style broad and flat, with the pubescent appendages various in form. Achenia oblong-turbinate, densely silky-villous. Pappus of numerous soft unequal densely scabrous capillary bristles, commonly bright white.—Dwarf suffrutescent plants of alpine aspect (natives of the Rocky Mountains, &c.), densely cæspitose, of a cinereous hue, or sometimes covered with a resinous exudation, the fastigiate stems or scapes numerous from the ligneous branching caudex, terminated by showy heads (large for the size of the plant). Leaves linear or lanceolate, 1–3-nerved, rigid, persistent, entire, alternate or crowded. Flowers bright yellow.

A group of plants well marked in habit, and doubtless generically distinct from the true Aplopappus.

§ 1. *Flowering stems or scapes somewhat simple and naked, bearing single heads: leaves cinereous: rays* 10–12: *pappus and silky hairs of the achenia bright white.*

1. *S. acaulis* (Nutt.! l. c.): leaves clustered at the summit of the thick branched caudex, spatulate-lanceolate, mucronate-acute, somewhat 3-nerved, minutely hispid-scabrous; scapes nearly leafless; scales of the nearly glabrous involucre short, oblong-ovate, acute, chartaceous, with scarious margins, somewhat in 2 series; rays short, often 2-cleft; appendages of the style in the disk-flowers subulate-linear, longer and narrower than the stigmatic portion.—Chrysopsis acaulis, *Nutt.! in jour. acad. Philad.* 7. *p.* 33, *t.* 3, *f.* 1.

Borders of Little Godin River in the Rocky Mountains, towards the sources of the Oregon, *Mr. Wyeth!* June.—"A small, tufted alpine, only 3–4 inches high." Leaves scarcely an inch long; those of the simple scape 1–2 and much smaller, or none.

2. *S. pygmæus:* very dwarf; leaves spatulate, obtuse, somewhat 3-nerved, fimbriate-ciliate; the radical as long as the simple leafy scape; head bracteate; scales of the involucre oblong, obtuse, ciliate, rather rigid; rays oblong-linear.

Rocky Mountains, probably in about lat. 41°, *Dr. James!*—Scarcely 2 inches high, slightly cinereous. Ovaries hairy. Style, &c. as in the preceding.

3. *S. armerioides* (Nutt.! l. c.): glabrous; leaves crowded at the summit of the thick woody caudex, elongated spatulate-linear, obscurely 3-nerved;

those of the simple scape 1–2; scales of the involucre roundish-oval, very obtuse, coriaceous, with abrupt scarious margins, closely imbricated somewhat in 3 series; style with short and thick lanceolate appendages.

On shelving rocks towards the sources of the Platte, *Nuttall!*—Plant a span high, with the aspect of an Armeria. Leaves very rigid, pale or whitish, but shining, 3 inches long, not 2 lines wide, sometimes a little resinous, as well as the rigid rounded scales of the involucre.

4. *S. cæspitosus* (Nutt.! l. c.): glabrous or nearly so; leaves crowded at the summit of the woody caudex, narrowly lanceolate or linear, acute, 3-nerved; those of the simple or branching scapes 3–4; scales of the involucre broadly ovate, acute, membranaceous, erose-ciliate, imbricated in 3 series; appendages of the style subulate-linear, minutely pubescent.—Chrysopsis cæspitosa, *Nutt.! in jour. acad. Philad.* 7. *p.* 33.

Vallies of the Rocky Mountains, towards the sources of the Missouri and Platte, *Mr. Wyeth! Nuttall!* July.—Plant 4–6 inches high. Leaves perfectly smooth and glabrous, or with a few scattered hairs.

§ 2. *Leaves crowded on the somewhat ligneous branching flowering stems, often covered with a resinous exudation: rays* 12: *pappus and silky hairs of the achenia bright white.*

5. *S. linearifolius:* glabrous, much branched; the branches naked and pedunculiform at the summit; leaves narrowly linear, acute, 1-nerved, glandular-punctate; scales of the glabrous involucre lanceolate-oblong, acute, somewhat membranaceous, with broad scarious margins, in 2 series, somewhat equal, the inner as long as the disk; appendages of the style ovate, thickened, much shorter than the linear stigmatic portion.—Aplopappus linearifolius, *DC.! prodr.* 5. *p.* 347; *Hook.! & Arn.! bot. Beechey, suppl. p.* 350.

California, *Douglas!*—Leaves an inch or more in length. Head nearly an inch in diameter; the involucre looser than in the preceding.

6. *S. florifer:* stem rather short, branched, hairy; leaves all linear-spatulate, slightly hairy, entire, glaucous; heads solitary, terminating the pedunculiform branches; exterior scales of the involucre pubescent-hirsute; the interior membranaceous, fimbriate-ciliate; rays rather broad, spreading, twice the length of the involucre; bristles of the pappus very white. *Hook.*—Aplopappus florifer, *Hook. & Arn. bot. Beechey, suppl. p.* 351. Erigeron? florifer, *Hook. fl. Bor.-Am.* 2. *p.* 20.

β. leaves obovate-spatulate. *Hook. & Arn. l. c.*

Dry rocks and sandy grounds, near Priest's Rapids of the Oregon, and Lewis & Clarke's River, *Douglas!* *β.* Snake Country, *Mr. Tolmie.*—Said to be very nearly allied to A. linearifolius, but with different foliage. The description does not satisfactorily accord with any of the preceding; and the following exhibits a tawny or ferruginous pappus in the youngest state, &c.

§ 3. *Flowering stems somewhat leafy, bearing* 1 *to* 3 *obovoid fewer-flowered heads: rays* 8: *pappus ferruginous.* (Oonopsis, *Nutt.*)

7. *S. multicaulis* (Nutt.! l. c.): flowering stems numerous from a woody caudex, simple or somewhat branched, tomentose-cinereous (as well as the leaves and involucre) when young, at length nearly glabrous; leaves linear, 1-nerved; the lowest subspatulate-linear and obtuse; those of the flowering stems 3–5, acute; heads bracteate or subtended by a leaf; scales of the involucre ovate, acuminate, membranaceous (6–9), in 2 series; appendages of the style linear-oblong.

Rocks, on the western declivity of the Rocky Mountains, *Nuttall!*—Stems 2–4 inches long, a little longer than the tufted leaves, the latter 1–2 lines wide. Pappus scanty, of about 2 series of unequal bristles, shorter than the corolla.

46. ISOPAPPUS.

Heads several-flowered; the ray-flowers 5–12, ligulate, pistillate, those of the disk 10–20, tubular, perfect. Scales of the cylindrical-campanulate involucre lanceolate-subulate, imbricated in 2–3 series, appressed. Receptacle small, alveolate, the alveoli nearly entire. Corolla of the disk slightly dilated upwards, 5-toothed. Appendages of the style subulate, hirsute, much longer than the stigmatic portion. Achenia linear-oblong, terete, attenuate at the base, silky-villous. Pappus a single series of capillary scabrous entirely similar and nearly equal bristles.—Hirsute and scabrous loosely paniculate-branched biennial herbs, with small heads on slender peduncles. Leaves alternate, crowded, sessile, lanceolate, 1-nerved and somewhat veiny, sparsely hispid-ciliate, often sparingly serrate.

1. *I. divaricatus:* glandular-scabrous and sparsely-hispid; branches and peduncles slender, divaricate-spreading; leaves rigid, linear-lanceolate, very acute, entire or acutely and remotely serrate, tapering towards the base; scales of the oblong involucre linear-subulate, hairy; rays 5–8; the disk-flowers 7–14.—Chrysopsis divaricata, *Nutt.! gen.* 2. *p.* 152 (under Inula); *Ell.! sk.* 2. *p.* 338. C. Lamarckii, *Nutt.! in trans. Amer. phil. soc. l. c. p.* 315. Diplopappus? (Chrysopsis) divaricatus, *Hook.! compan. to bot. mag.* 1. *p.* 97. Heterotheca Lamarckii, *DC. prodr.* 5. *p.* 317, as to spec. char. & syn. *Nutt.* & *Ell.*; excl. syn. *Cass.* & *Lam.* (which relate to Heterotheca scabra), & *Pluk. alm.*, which probably represents Chysopsis Mariana.

Dry sandy woods and fields, Georgia! to Florida! Louisiana! and Texas! Aug.–Oct.—Plant 1–2 feet high, sometimes nearly glabrous when old, with a very effuse panicle; the filiform pedicels usually minutely glandular and hispid. Heads about a quarter of an inch in length. Pappus ferruginous, not unlike that of a true Erigeron; the bristles rather numerous but in a single series, slender, entirely similar, and nearly all of equal length, a very few being more or less shorter.—On account of the entirely simple pappus of this plant, and its peculiar habit, Mr. Elliott long since suggested the propriety of separating this plant from Chrysopsis, but he evidently did not intend to include it in his genus Calycium, as De Candolle supposed. It is most nearly allied to the doubtful section of Aplopappus, or perhaps genus, Blepharodon, *DC.*; which, however, has many-flowered heads, a copious pappus of unequal bristles, &c.

2. *I. Hookerianus:* stem branched from the base, and with the somewhat spreading branches roughish-hirsute, not glandular; leaves oblanceolate or oblong-spatulate, fringed with bristles along the attenuate base or margined petiole, obscurely serrulate towards the apex, mucronulate, nearly glabrous; scales of the short campanulate involucre almost glabrous, subulate-lanceolate; rays 12; the disk-flowers about 20.

Gonzales, Texas, *Drummond!*—Stems about 10 inches high; the leaves somewhat scattered; the branches bearing few heads on erect peduncles. Pappus ferruginous.—Only a few specimens having been collected, this species is not to be found in many of the sets of the late Mr. Drummond's

plants. The specimens we have examined are in the herbarium of Sir Wm. Hooker.

47. APLOPAPPUS. *Cass.; DC. prodr.* 5. *p.* 345, excl. spec.

Heads many-flowered; the ray-flowers numerous, ligulate, pistillate, sometimes wanting; those of the disk tubular, perfect. Scales of the involucre lanceolate or linear, imbricated. Receptacle flat, foveolate, or alveolate and somewhat fimbrillate. Achenia silky, somewhat terete, oblong or turbinate. Pappus of copious unequal and more or less rigid scabrous bristles.—Mostly perennial herbs or suffruticose plants (chiefly natives of the Andes and the Pacific coast of America); with alternate usually serrate or spinulose-toothed leaves. Heads solitary or somewhat corymbose. Flowers yellow.

We have no species which entirely accord with the Chilian Euaplopappi. Some of the Aplodisci are most nearly allied to them, except that they have no rays; but the presence or absence of rays appears to be of minor consequence when the capitula are homochromous. Perhaps Pyrrocoma and Prionopsis hardly deserve the rank of genera, but it is more convenient to separate them.

§ 1. *Scales of the hemispherical or campanulate involucre linear-lanceolate: achenia obovoid-oblong or turbinate, silky-villous: pappus of copious and very unequal but nearly capillary bristles: perennial or suffrutescent: leaves pinnately lobed or incised; the lobes or teeth pointed with bristles.*—BLEPHARODON, DC. (excl. no. 9.)

1. *A. rubiginosus:* suffruticose? branching from the base, viscidly pubescent and cinereous; leaves lanceolate or narrowly oblong, mostly narrowed at the base, sessile, laciniate-incised; the divaricate teeth produced into pellucid bristles; heads subglobose, solitary or corymbose, terminating the leafy branches, often bracteate; scales of the involucre linear, acute, viscidly puberulent, in about 2 series, nearly equal, loose, at length spreading; achenia turbinate, densely silky-villous; pappus bright reddish-brown.

Texas, *Drummond!*—Stems erect or decumbent, corymbosely branched, about 10 inches high. Heads rather smaller than in Chrysopsis Mariana, on short stout peduncles. Rays 15–18, elongated. Scales of the involucre tipped with a bristle. Alveoli of the receptacle pilose-fimbrillate. Corolla of the disk-flowers dilated at the throat, rather deeply toothed. Appendages of the style oblong-ovate, broader and much shorter than the stigmatic portion. Achenia silky-canescent. Bristles of the pappus in about 3 series of unequal length.—Allied apparently to A. phyllocephalus, *DC.*, of Mexico.

2. *A. spinulosus* (DC.): herbaceous; canescent with a soft minute woolly pubescence, or at length almost glabrous; stems many from the same root, corymbosely branched above; leaves (small) rigid, pinnately or somewhat bipinnately parted; the segments short, linear-subulate, mucronate with a short bristle; heads subglobose, terminating the numerous branchlets; involucre shorter than the disk; the scales subulate-lanceolate, mucronulate, imbricated in 3–4 series, appressed, canescent; achenia turbinate, villous; pappus (pale or tawny) very unequal.—*DC. l. c.*—Amellus? spinulosus, *Pursh, fl.* 2. *p.* 564, (but the descr. does not perfectly accord); *Torr.! in ann. lyc. New York*, 2. *p.* 213. Starkea? pinnata, *Nutt.! gen.* 2. *p.* 169. Diplopappus pinnatifidus, *Hook.! fl. Bor.-Am.* 2. *p.* 22. Dieteria spinulosa, *Nutt.! in trans. Amer. phil. soc. l. c. p.* 301.

Plains of the Missouri to the Rocky Mountains! Aug.–Sept.—Stems 1–2

feet high. Leaves an inch or more in length. Heads small. Rays 20–30. Corolla of the disk with very short teeth. Style nearly as in the preceding, but the appendages as long as the stigmatic portion. Pappus short, rather rigid, very unequal, in about 3 series.

§ 2. *Scales of the hemispherical involucre lanceolate, more or less imbricated: achenia oblong or turbinate, villous: pappus of unequal and strongly scabrous but almost capillary bristles: stems low, scape-like, from a fusiform caudex, bearing solitary or few rather large heads: leaves chiefly radical, petioled, lanceolate, mostly with cartilaginous or spinulose teeth.*—ARNICELLA.

* *Scales of the involucre lanceolate-oblong, chartaceous, unequal, imbricated in* 3 *series: pappus shorter than the corolla of the disk.*

3. *A. lanceolatus:* stem and petioles at first lanuginous, at length nearly glabrous; leaves coriaceous: the radical and lowest cauline lanceolate, acute, irregularly spinulose-toothed, petioled; the upper small and bract-like, linear-lanceolate, partly clasping; heads 2–5; achenia silky.—Donia lanceolata, *Hook.! fl. Bor.-Am.* 2. *p.* 25. Homopappus (Actinaphoria) multiflorus, *Nutt.! in trans. Amer. phil. soc. l. c. p.* 333.

Saskatchawan, *Drummond!* Plains both east and west of the Rocky Mountains in about lat. 41°, *Nuttall!*—Plant from 6 to 24 inches high. Appendages of the style lanceolate, about the length of the stigmatic portion. Rays 20 to 25, pistillate, and to all appearance fertile.

* * *Scales of the involucre linear-lanceolate, herbaceous, nearly equal, loose, in about* 2 *series: pappus not very copious, as long as the corolla of the disk.*

4. *A. uniflorus:* somewhat woolly when young, at length glabrous; leaves rigid; the radical lanceolate, acute, sparingly and coarsely spinulose-toothed, or some of them entire, petioled; the cauline linear-lanceolate, partly clasping; heads commonly solitary; involucre at length nearly glabrous; achenia silky-villous.—Donia uniflora, *Hook.! fl. Bor.-Am.* 2. *p.* 25, *t.* 124. Homopappus uniflorus, *Nutt. l. c.*

Plains of the Saskatchawan and prairies of the Rocky Mountains, *Drummond!*—Stems 5–10 inches high, from a thick caudex. Appendages of the style oblong-lanceolate. Rays 25–30, fertile.

5. *A. inuloides:* tomentose-woolly throughout; the pubescence mostly persistent; leaves lanceolate, acute, entire, or sparingly spinulose-serrulate; the radical tapering to the base but nearly sessile; heads usually solitary; involucre very woolly; achenia villous.—Homopappus (Actinaphoria) inuloides, *Nutt.! in trans. Amer. phil. soc. l. c.*

Moist grassy plains of the Rocky Mountains, towards the sources of the Platte, *Nuttall!*—Plant 3–4 inches to a foot high. Rays 40–50, *Nutt.*—Appendages of the style lanceolate-subulate. The rays are pistillate and apparently fertile. The species is very nearly allied to the preceding, and perhaps not distinct.

6. *A.? alpigenus:* caudex thick, branched; radical leaves narrowly spatulate or oblanceolate, obtuse. entire, somewhat petioled, about 3-nerved, glabrous; the cauline few and small, linear, 1-nerved, slightly pubescent; head solitary, terminating the short ascending scapiform stems; scales of the involucre linear, rather acute, pubescent, loosely imbricated in a double series; the exterior a little shorter; achenia oblong-linear, at length nearly glabrous.

On Mount Ranier, Oregon! collected either by *Douglas* or *Mr. Tolmie*; the specimen communicated by Sir Wm. Hooker.—Stem or scape 3–4 inches high, bearing 3 or 4 small leaves below the middle, tomentose-pubescent near the summit. Radical leaves 1–3 inches long, apparently rather fleshy. Heads nearly as large as in A. uniflorus, to which it is manifestly allied; from which we infer the ray (twice the length of the involucre) to have been yellow, which is uncertain from the specimen. Pappus whitish, barbellate-scabrous. Achenia at first villous-pubescent, the hairs deciduous. Appendages of the style elongated-subulate, much longer than the stigmatic portion.

§ 3. *Rays wanting*.—APLODISCUS, DC.

* *Involucre obconical, as long as the disk; the scales regularly imbricated in* 4–5 *series, oblong, with narrow scarious margins, and slightly herbaceous and spreading tips: corolla dilated at the summit, the teeth spreading.* (Aplodiscus, *DC.* Isocoma, *Nutt.*)

7. *A. Menziesii:* stem suffruticose; the branches elongated, simple, somewhat pubescent; heads in terminal corymbose clusters; leaves oblanceolate or linear-spatulate, impressed-punctate, somewhat fleshy, glabrous, spinulose-serrate towards the apex, often fascicled in the axils; appendages of the style ovate, acute, much shorter than the stigmatic portion; achenia silky.—Pyrrocoma Menziesii, *Hook. & Arn. bot. Beechey, suppl. p.* 351. Isocoma vernonioides, *Nutt.! in trans. Amer. phil. soc. l. c. p.* 320.

California, *Menzies.* Common in marshes near the sea, at St. Barbara, *Nuttall!* April–May.—Plant 1–2 feet high.

* * *Involucre elongated obconical; the oblong-linear scales regularly imbricated in numerous series on the slender cylindrical rachis, with herbaceous squarrose tips, the innermost as long as the disk: corolla not dilated at the summit.*

8. *A. squarrosus* (Hook. & Arn.): slightly pubescent, somewhat resinous or glutinous; stem shrubby, branched; heads crowded or spicate at the summit of the branches and in the upper axils; leaves crowded, obovate-oval, rigid, 1-nerved, obscurely veined, closely serrate with mucronate spreading teeth, very obtuse, partly clasping; appendages of the style ovate-lanceolate, as long as the stigmatic portion; achenia nearly glabrous.—*Hook. & Arn.! bot. Beechey, p.* 146; *DC. prodr. 7. p.* 280. Pyrrocoma grindelioides, *DC.! prodr. 5. p.* 350; *Hook. & Arn.! l. c. suppl. p.* 351.

California, *Capt. Beechey, Douglas!* &c. Plant with the habit of some species of Baccharis. Leaves of the branches an inch long. Heads two-thirds of an inch in length. Receptacle narrow.

* * * *Involucre hemispherical, as long as the disk; the scales lanceolate, imbricated in about* 3 *series, appressed: corolla longer than the very unequal pappus, not dilated at the summit,* 4–5-*toothed.* (Eriocarpum, *Nutt.*)

9. *A. Nuttallii:* cinereous-tomentose, dwarf; stems numerous from a woody base or caudex, leafy, bearing several somewhat corymbose (small) heads; leaves cuneiform-oblong, sessile, serrate-toothed, the teeth ending in bristles, when old somewhat glabrous; appendages of the style oblong-lanceolate; achenia silky-villous.—Eriocarpum grindelioides, *Nutt.! in trans. Amer. phil. soc. l. c. p.* 321.

On shelving rocks in the Rocky Mountain range, Oregon, *Nuttall!*—Plant about 6 inches high, with the habit, pappus, &c. of a genuine Aplopappus. Alveoli of the receptacle strongly toothed.

48. PYRROCOMA. *Hook. fl. Bor.-Am.* 1. *p.* 306, *t.* 107.

Sect. Eupyrrocoma § Bracteosæ, *DC.*—Homopappus (partly) & Pyrrocoma, *Nutt.*

Heads many-flowered; the ray-flowers numerous, pistillate, but sometimes infertile or inconspicuous; the disk-flowers tubular, perfect. Scales of the hemispherical or campanulate involucre rigid, somewhat foliaceous, nerveless, oblong, with more or less squarrose or herbaceous tips. Receptacle flat, alveolate-toothed. Corolla of the disk cylindrical, slightly dilated upwards, with short erect teeth. Branches of the style in the disk-flowers subulate-linear, elongated, the hispid appendages much longer than the stigmatic portion; those of the ray often unequal or one of them abortive, glabrous. Achenia linear, elongated, somewhat 3-angled and striate, glabrous, rarely hairy. Pappus (reddish-brown or fulvous) of copious and uniform slender rigid bristles, usually longer than the corolla of the disk, expanding.—Perennial rigid herbs (natives of Oregon), with simple stems; the showy heads terminal or in the axils of the upper leaves, often sessile. Leaves coriaceous, alternate, lanceolate or oblong, sessile, 1-nerved, reticulate-veined, obscurely pellucid-punctate, sharply serrate or entire. Flowers yellow.

§ 1. *Heads very large and broad, with foliaceous bracts; the rays slender, concealed in the pappus or exserted* (*the margins involute in dried specimens*), *infertile.*—EUPYRROCOMA.

1. *P. carthamoides* (Hook.! l. c.): stem (and young leaves) pubescent, terminated by a single bracteate head; leaves oblong-lanceolate, mucronate-acuminate, sparingly spinulose-serrulate; the lowest tapering into slender petioles; bracts similar to the uppermost leaves, as long as the proper involucre; corolla of the ray and disk shorter than the pappus.—*DC.! prodr.* 5. *p.* 350.

Oregon, (in the interior?) *Douglas!*—Stem rather stout, a foot or more high. Head more than an inch in diameter; the proper scales of the involucre oblong, imbricated in 3 to 4 series, shorter than the disk.—The close resemblance of this plant to the following radiate species induced us to examine it more attentively; and we find that the head is not truly discoid, as has been supposed; but there is an outer series of rays, which are so concealed in the pappus as readily to escape observation. One of the branches of the style in these flowers is suppressed or abortive; the other is stigmatose, but the ovary is apparently infertile.—It is not improbable that the rays will be found to be sometimes a little exserted.

2. *P. radiata* (Nutt.): very glabrous; leaves shining, reticulated, clasping; the radical (petioled) and lower cauline obovate-oblong, entire; the upper ovate-lanceolate or oblong, sparingly spinulose-serrate or entire; heads usually several and somewhat corymbose; bracts fewer, passing into the scales of the involucre; rays (about 25) exserted; the corolla of the disk as long as the pappus.—*Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 333.

Plains of Oregon near Walla-wallah, *Nuttall!*—Stem stout, 12–18 inches high. Leaves very thick, 3–6 inches long, the lower 2 inches broad. Heads nearly as large as in Inula Helenium! Involucre much like that of Liatris scariosa; but the scales not dilated above, and acutish, imbricated in 5 or 6

series, more or less subtended with foliaceous bracts, shorter than the disk. Rays very narrow, rigid, exserted, but inconspicuous. Achenia fully a third of an inch long, about the length of the rigid expanding pappus; the bristles of which are barbellate-scabrous (more so than the preceding), some of them very obscurely thickened towards the apex.—The exterior covering of the fruit, or calyx-tube, as in the whole genus, is readily separable from the proper ovary.

§ 2. *Heads smaller and fewer-flowered: the involucre scarcely bracteate; the rays manifest, and usually fertile.*—HOMOPAPPUS, Nutt. (excl. spec.)

* *Heads hemispherical: involucre imbricated in 3 series, shorter than the disk: achenia sparsely hirsute.*

3. *P. racemosa:* stem glabrous, bearing several (3–7) racemose heads at the summit; the peduncles and the ovate-oblong scales of the involucre pubescent; leaves glabrous, lanceolate, slightly spinulose-serrate; the upper acute, oblong-lanceolate, partly clasping; the lower tapering to the base, somewhat petioled; corolla of the disk shorter than the pappus.—Homopappus (Myrianthus) racemosus, *Nutt.! in trans. Amer. phil. soc. l. c. p.* 332.

Plains of the Wahlamet, *Nuttall!*—Plant 12–18 inches high. Entirely a Pyrrocoma; but the heads reduced in size (less than an inch in diameter); the involucre of fewer scales, and not subtended by leafy bracts; the rays (15–20) rather conspicuous and fertile; and the achenia hairy.

* * *Heads obovoid, sessile and often clustered: involucre as long as the disk; the scales linear-oblong, with short distinct herbaceous tips, imbricated in several series: achenia glabrous.* (Intermediate between Pyrrocoma and Aplopappus.)

4. *P. paniculata:* glabrous; stem branched at the summit; the heads sessile and somewhat clustered along the branches, about the length of the bracteal leaf; scales of the involucre oblong, obtuse, mucronate; rays 10–12, slender; young achenia slightly hairy towards the summit; leaves oblong-lanceolate, mucronate, obscurely and remotely serrulate; the cauline partly clasping.—Homopappus paniculatus, *Nutt.! l. c.*

Plains of the Oregon near Walla-wallah, in wet places, *Nuttall!*—Plant a foot high; the leaves (entirely like a genuine Pyrrocoma) and involucres, as also in the following species, often slightly covered with a resinous exudation. Heads numerous, more than half an inch long; the rays fertile.

5. *P. arguta:* glabrous; heads axillary and terminal, clustered, sessile; scales of the involucre lanceolate, acute; rays 10–12; leaves spatulate-lanceolate, somewhat acuminate, sharply serrate, the cauline partly clasping. *Nutt.*—Homopappus argutus, *Nutt.! l. c.*

Plains of the Oregon, with the preceding, *Nuttall!*—Very similar to the following, according to Nuttall: it appears to us more closely to resemble the preceding species. The rays in the specimens which we have examined are entirely neutral.

6. *P. glomerata:* glabrous; stem simple or branched; the heads (short) clustered and disposed in an interrupted spike; scales of the involucre oblong, obtuse; rays 8–10; leaves oblong-lanceolate, the lower spatulate-lanceolate, very acute, mostly entire; the cauline partly clasping.

Plains of the Oregon, with the preceding, *Nuttall!*—Heads nearly as broad (half an inch) as long. Rays fertile.

49. PRIONOPSIS. *Nutt. in trans. Amer. phil. soc. (n. ser.) 7. p. 329.*

Heads broadly hemispherical, many-flowered; the rays numerous (in a single series), ligulate, pistillate; those of the disk tubular, perfect, but more or less infertile. Scales of the involucre very numerous, lanceolate, cuspidate, somewhat unequal, the exterior squarrose and foliaceous. Receptacle broad and flat, slightly alveolate. Corolla of the disk slightly dilated upwards, 5-toothed. Appendages of the style in the disk-flowers lanceolate-oblong, obtuse, rather short. Achenia short, very glabrous, somewhat striate, turgid; in the ray oval; in the disk cylindrical-oblong, or the infertile oblong-linear. Pappus deciduous, composed of copious and very unequal rigid scabrous bristles; the inner series (5–10) setose and stronger than the others, longer than the corolla (of the disk) and much longer than the achenia; the others successively shorter and more slender.—Stout biennial plants, with the aspect and spinulose-toothed leaves of Grindelia. Heads large and showy: flowers yellow.

The short and very smooth achenia, and the deciduous pappus, form the chief, if not the only distinctions between this genus and true Aplopappus: we are not sufficiently acquainted with the South American species to judge of the importance of these characters. The perennial species from Florida here subjoined, has short and glabrous ovaries, but perhaps a persistent pappus: if so, this genus should probably be considered a section of Aplopappus.

1. *P. ciliata* (Nutt.! l. c.): glabrous; stem stout, simple or sparingly branched; leaves elliptical, very obtuse, partly clasping, somewhat veiny, closely and sharply serrate-toothed, the teeth all pointed with bristles.—Donia ciliata, *Nutt.! in jour. acad. Philad.* 2. *p.* 118; *Hook. exot. fl.* 1. *t.* 45. Aplopappus (Leiachenium) ciliatus, *DC.! prodr.* 5. *p.* 346.

Arkansas, on the alluvial banks of Great Salt River, *Nuttall!* Texas, *Drummond!* Aug.–Oct.—Stem about 3 feet high. Involucre an inch in diameter, somewhat glutinous. Pappus of the ray rather shorter than in the disk, often deciduous in a ring. Inner bristles of the pappus terete, attenuate from the base to the middle, and thence obscurely thickened upwards; the outermost very slender and scarcely exceeding the achenia, the others intermediate in size, &c.

2. *P.? Chapmanii:* stems simple, virgate, hirsute-pubescent; leaves erect, numerous, narrowly lanceolate or linear, glabrous, pungently acute, setaceously serrate; the radical ones elongated; the uppermost short, somewhat hairy, appressed; scales of the involucre lanceolate, very acute or cuspidate, squarrose; rays elongated.

Swamps in pine barrens, Middle Florida, *Dr. Chapman!* June–July.—♃ Stem 1–2 feet high, bearing 1 to 3 or 4 heads. Leaves slightly nerved; the radical ones clustered, 4–6 inches long, tapering to the base, sometimes entire; the cauline successively decreasing in length, serrate with scattered bristly teeth, much as in Eryngium aquaticum. Head about three-fourths of an inch in diameter; the involucre rather shorter than the disk. Receptacle broad and flat, slightly alveolate and fimbrillate. Rays 30–40, narrowly linear. Appendages of the style in the disk-flowers narrowly lanceolate, longer than the stigmatic portion. Achenia (immature) very short. Pappus rigid, ferruginous, nearly as in the preceding, but the bristles less unequal.—We have not seen the mature achenia, and are not entirely sure that the rays are yellow.

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50. CENTAURIDIUM.

Heads many-flowered; the ray-flowers about 20, ligulate, pistillate; those of the disk tubular, perfect. Involucre subglobose; the scales (few) closely imbricated in 2–3 series, appressed, coriaceous at the base, the upper herbaceous portion dilated rhombic-ovate, cuspidate or mucronate; the inner with scarious margins. Receptacle flat, strongly fimbrilliferous; the subulate fimbrillæ nearly the length of the achenia. Corolla of the disk somewhat dilated above, 5-toothed. Appendages of the style (in the disk-flowers) subulate-filiform, hispid, 3–4 times the length of the linear-oblong flat stigmatic portion. Achenia short, obovoid-turbinate, obscurely 4-sided, minutely appressed-pubescent. Pappus persistent, spreading when old, composed of 10 subulate-filiform rigid bristles, which are flattened and dilated towards the base, minutely scabrous above, longer than the corolla (of the disk) and twice the length of the achenia, 10 similar but smaller ones nearly one-half shorter, and usually about 5 still smaller and exterior.—An annual or biennial glabrous herb; the stem and fastigiate branches slender, rather thickly clothed with linear-lanceolate 1-nerved cuspidate-acute alternate leaves with scabrous margins, and terminated by solitary small heads. Flowers apparently light yellow.

C. Drummondii.

Texas, *Drummond! Dr. Riddell!*—Plant 20–30 inches high; the virgate branches minutely scabrous. Leaves erect, pale, about an inch long, sessile, the lower sometimes very slightly serrate. Heads half an inch in diameter; the rays linear-lanceolate, elongated. Fimbrillæ of the receptacle white, chaffy, united only at the base, setaceous, not unlike the pappus. Achenia about a line and a half long, all fertile, but those of the ray often larger than the others, or perhaps maturing earlier; the setiform-subulate definite pappus radiate-spreading in fruit. Heads in appearance not unlike some species of Centaurea.

51. GRINDELIA. *Willd. mag. nat. Berl.* 1807, *p.* 261; *Dunal, mem. mus. Par.* 5. *p.* 48; *DC. prodr.* 5. *p.* 314.

Donia, *R. Br.* (1813)—Demetria, *Lagasca*, (1814.)

Heads many-flowered; the ray-flowers ligulate, pistillate, in a single series (or very rarely wanting); those of the disk tubular, perfect. Involucre hemispherical or subglobose; the scales numerous and imbricated in several series. Receptacle flat, foveolate. Corolla of the ray elongated; of the disk tubular-infundibuliform, 5-toothed. Branches of the style linear, rather acute, the hairy appendages as long as the stigmatic portion. Achenia obovate or oval, somewhat angled, glabrous. Pappus of few (2–8) rigid or corneous bristles or awns, very deciduous.—Perennial, biennial? or suffruticose plants (all American, and chiefly Mexican); with the stems mostly branched. Leaves entire or serrate, somewhat pellucid-punctate or reticulate-punctate; the radical ones usually spatulate; the cauline sessile or partly clasping.

Heads solitary at the extremity of the branches; the involucre, and often the branchlets, as well as the (yellow) corolla, &c. covered with a glutinous varnish, particularly when young. Disk-flowers sometimes infertile.

1. *G. cuneifolia* (Nutt.): herbaceous? glabrous; leaves entire (the lower unknown), cuneate-oblong, or the uppermost linear-oblong, mucronate-acute, partly clasping, somewhat fleshy, pellucid-(reticulate-) paniculate; heads (rather large) leafy at the base; scales of the involucre with linear-subulate recurved-squarrose appendages; pappus of 5 or 6 short and stout nearly terete bristles.—*Nutt.! in trans. Amer. phil. soc. l. c.* G. squarrosa *β.* fol. subinteg. carnosula opaca, *Hook. & Arn. bot. Beechey, p.* 147.

California, at St. Barbara, *Nuttall!*—Mr. Nuttall obtained only imperfect specimens, and thinks the plant may perhaps be only a variety of G. glutinosa. The thick awns of the pappus are considerably shorter than the corolla, and not at all angled or scabrous.

2. *G. inuloides* (Willd.): stem suffruticose at the base, branching and pubescent or hirsute-pubescent above; cauline leaves ovate-oblong, rather glabrous, broader and cordate at the base, partly clasping, obtuse or rather acute, evenly serrate-toothed; scales of the involucre glabrous, produced into linear-subulate spreading or recurved appendages; bristles of the pappus 1–3.—*Willd. l. c. p.* 261, & *enum.* 2. *p.* 894; *Dunal! l. c. t.* 15; *Bot. reg. t.* 248; *DC. prodr.* 5. *p.* 315; *Hook.! bot. mag. t.* 3737. G. pubescens, *Nutt.! in jour. acad. Philad.* 7. *p.* 74. G. spathulata, *Link, enum.*, ex *DC.* Aster spathulatus, *Hort. Madr.!* &c. Demetria spathulata, *Lagasca, elench. hort. Madr.* (1814) *p.* 20. Inula serrata, *Pers.*

β. branches, leaves, and involucre glandular-hairy. *Hook. fl. Bor.-Am.* 2. *p.* 25, under Donia.

γ. leaves ovate-oblong or elliptical, obtuse; the upper finely pectinately serrate, mostly tipped with glands; achenia of the disk often sterile.—G. microcephala, *DC. l. c.?* (which is said to have a pappus of 4–5 bristles.)

Texas, *Belandier! Drummond!* (*α.* & *γ.*) Arkansas, *Nuttall!* *β.* Sources of the Wahlamet, *Douglas*, ex *Hook.* Aug.–Oct.—Sent many years ago by Sessé from Mexico to the Botanic Garden of Madrid; not uncommon in cultivation.

3. *G. hirsutula* (Hook. & Arn.): stem herbaceous, glabrous below, hairy towards the summit; cauline leaves sessile and partly clasping, oblong, obtuse, sharply serrate-toothed, the younger pubescent; inner scales of the involucre glutinous, appressed: the exterior tomentose-pubescent, squarrose; bristles of the pappus 2–3.—*Hook. & Arn.! bot. Beechey, p.* 147, & *suppl. p.* 351; *DC. prodr.* 7. (*mantiss.*) *p.* 278. G. rubricaulis, *DC. prodr.* 5. *p.* 316.

California, *Capt. Beechey, Douglas!*—Stem and elongated nearly simple branches purplish. Leaves rigid, 1–3 inches long, narrowly oblong, the lower oblong-spatulate, reticulate-punctate.

4. *G. robusta* (Nutt.): very glabrous; stem herbaceous; leaves oblong, very obtuse, coarsely serrate, cordate-clasping; involucre leafy at the base; the scales produced into recurved-squarrose subulate-linear appendages; pappus of 2 (or more?)-bristles.—*Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 314.

St. Pedro, California, *Nuttall!* April.—A very stout and robust species, about 18 inches high, apparently biennial. Leaves about an inch broad, one and a half [to 2 inches] long. Heads very large, more than twice the size of those of G. squarrosa, which this species much resembles; but the leaves are broadest at the base. *Nutt.*

5. *G. squarrosa* (Dunal): herbaceous or nearly so, glabrous; stem corym-

bosely branched; leaves oblong or oblong-lanceolate, obtuse, slightly or finely serrate (seldom spinulose-toothed), somewhat clasping; scales of the glutinous involucre with recurved-squarrose or mostly circinate subulate tips; bristles of the pappus 2–4.—*Dunal, l. c. p.* 50; *Richards. appx. Frankl. journ. ed.* 2. *p.* 33; *Torr.! in ann. lyc. New York*, 2. *p.* 212; *DC.! l. c.* Donia squarrosa, *Pursh. fl.* 2. *p.* 559; *Bot. mag. t.* 1706; *Nutt.! gen.* 2. *p.* 163; *Hook.! fl. Bor.-Am.* 2. *p.* 25. Aurelia amplexicaulis, *Cass.*, ex *DC.*

Dry plains, from the Upper Missouri! to the Rocky Mountains! and north to Saskatchawan! extending, according to Richardson, into the woody country between lat. 54° & 64°. July–Oct.—Plants 10–20 inches high. Leaves of a pale glaucous hue, small. Heads numerous, small; the involucre not exceeding half an inch in diameter in the wild plant.

6. *G. lanceolata* (Nutt.): herbaceous, glabrous; stem fastigiately and virgately branched; leaves lanceolate, acute, closely sessile, coarsely spinulose-serrate or incisely toothed; scales of the involucre with subulate-filiform straight appendages, nearly equal in length; the exterior loose; pappus mostly of 2 bristles.—*Nutt.! in jour. acad. Philad.* 7. *p.* 73.

β. leaves linear, sparsely spinulose-serrulate, or the upper entire.

γ.? leaves short, oblong-lanceolate, partly clasping, spinulose-serrulate; scales of the involucre with shorter appendages, more unequal and appressed.

Plains of Western Arkansas! Louisiana! and Texas! (*α.* & *β. Nuttall! Dr. Pitcher! Dr. Leavenworth! Drummond!*) *γ.*? Texas, *Drummond!* Sept.—Plant 1–3 feet high; with larger heads than the preceding, very glutinous; the elongated appendages of the involucral scales not recurved and circinate, but straight, spreading, or reflexed when old. Leaves pale, rigid; the lower incisely spinulose-serrate, or sometimes almost pinnatifid, 2–3 inches long. We have only seen an imperfect specimen of the doubtful var. *γ.*

7. *G. integrifolia* (DC.): stem herbaceous, with a few scattered hairs towards the summit; leaves puberulent or nearly glabrous, entire, with scabrous margins; the upper ones lanceolate, acute, broadest at the partly clasping base; the lower somewhat spatulate-oblong, rather obtuse, often slightly serrate; scales of the glutinous involucre produced into slender subulate-filiform spreading appendages; bristles of the pappus mostly 2.—*DC.! prodr.* 5. *p.* 315. Donia glutinosa, *Hook.! fl. Bor.-Am.* 2. *p.* 25, (excl. syn.).

β. virgata: stem more slender and virgately branched; leaves narrowly lanceolate; heads smaller.—G. virgata, *Nutt.! in trans. Amer. phil. soc. l. c.*

Oregon, common, *Dr. Scouler! Douglas! Nuttall!*—(2) Stem 3–4 feet high; the branches and upper leaves as well as the involucre and corolla, &c., more or less glutinous. The leaves rather thin. Heads about as large as in G. squarrosa, or in var. *α.* larger; the exterior scales with long filiform appendages.

8. *G. stricta* (DC.): stem herbaceous, strict, somewhat simple, glabrous at the base, sparingly hairy at the summit; cauline leaves much attenuate and entire at the base; the summit oblong, acuminate, serrate; scales of the involucre erect, linear, acuminate. *DC. prodr.* (*mantiss.*) 7. *p.* 278.

Port Mulgrave, on the North West Coast, *Hænke*, fide *De Candolle.*—This species is unknown to us; and there is so much confusion and uncertainty respecting the origin of the specimens in Hænke's collection, that we cannot be confident as to the habitat. The character nearly accords with G. humilis, except the somewhat hairy stem and erect scales of the involucre.

9. *G. humilis* (Hook. & Arn.): diffusely branched from the base, dwarf, herbaceous, glabrous; the stems mostly simple; leaves resinous-dotted, linear-spatulate or oblanceolate; the radical and lower cauline with a long attenuate base, the uppermost reduced to bracts; heads small; scales of the involucre with subulate squarrose-recurved appendages.—*Hook. & Arn. bot. Beechey, p.* 147.

a. cauline leaves entire or nearly so.—G. nana *β*. integrifolia, *Nutt.! in trans. Amer. phil. soc. l. c.*

β. leaves spinulose-toothed.—G. nana, *Nutt.! l. c.*

California, *Capt. Beechey*. Oregon near Fort Vancouver, *Nuttall!*—Stems 5–8 inches high, numerous from a perennial? root. Involucre nearly as in G. squarrosa. Rays about 16.

10. *G. discoidea* (Nutt.): herbaceous, perennial, glabrous; stems several from the same root, slender, fastigiately branched; leaves oblong-linear, tapering to the base, sessile, somewhat spinulose-serrulate above; heads small; scales of the involucre with short subulate squarrose-recurved appendages; pappus of 2 bristles; rays none.—*Nutt.! in trans. Amer. phil. soc. l. c. p.* 315.

Banks of the Oregon, *Nuttall!*—Heads rather smaller than in G. squarrosa, terminating the slender stems (a foot high) or branches. Leaves 2–3 lines wide.

52. PENTACHÆTA. *Nutt. in trans. Amer. phil. soc. (n. ser.)* 7. *p.* 336.

Heads many-flowered; the ray-flowers ligulate, numerous, in a single series (in 2–3 series, *Nutt.*); those of the disk tubular, perfect and fertile. Involucre hemispherical; the scales lanceolate, mucronate-acuminate, membranaceous, with broad scarious margins, loosely appressed and imbricated in 2–3 series. Receptacle convex, naked, areolate. Corolla of the ray oblong; of the disk tubular-infundibuliform, slightly incurved (the proper tube very short), unequally 5-cleft at the summit, the sinuses of the exterior lobe deepest; the lobes oblong-lanceolate, spreading. Anthers (naked at the base) tipped at the apex with a mucronate appendage. Branches of the style in the ray-flowers linear, glabrous, slightly exserted beyond the tube, stigmatose to the summit; of the disk consisting of a very short and flat stigmatic portion, terminated by a long subulate-filiform strongly barbellate-hispid appendage. Achenia oblong, hirsute, obscurely 5-angular. Pappus of the ray and disk similar, consisting of 5 elongated rigid scabrous bristles slightly dilated (and obscurely connected?) at the base, persistent.—A small and slender much branched annual; the branches terminated by solitary heads. Leaves alternate, numerous, sessile, filiform-linear, involute when dry, and like the stem furnished with scattered villous hairs, otherwise glabrous. Flowers golden yellow.

P. aurea (Nutt.! l. c.)

St. Diego, California, in dry plains near the sea. Flowering in April.—A very elegant, though often minute plant, from 2–3 inches to a foot high, branching usually from the base in an umbellate manner. Head about the size of a daisy, almost orange-yellow, with 20–50 rays much longer than the disk. . . Habit of some of the Chilian species of Chætanthera. Allied to the Mutisiaceæ, but with the stigma of Aster. *Nuttall.*—Involucre almost exactly as in Bradburia (which it also resembles in foliage and habit), but with fewer scales, with the central portion greenish. Rays simple, 4-nerved. Bristles of the pappus as in Elephantopus, but more abruptly dilated at the base; the habit also (not unlike some Pectideæ) and bilabiate corolla of the disk, would seem to indicate an affinity with the Vernoniaceæ. But the style is

certainly that of Asteroideæ, although the appendages are unusually narrow and prolonged.

Subdiv. 4. HETEROTHECEÆ, *DC.*—Rays in a single series. Pappus of the disk and ray dissimilar.

53. BRADBURIA. *Torr. & Gray;* not of *Raf.*

Heads many-flowered; the ray-flowers ligulate, pistillate, fertile, in a single series; those of the disk perfect but infertile. Involucre hemispherical-campanulate; the scales oblong-lanceolate, mucronate, membranaceous, shining, with broad scarious margins, imbricated in 3 or 4 series, appressed. Receptacle flat, areolate, nearly naked. Corolla of the ray linear, twice the length of the involucre; of the disk tubular, slender, 5-toothed, about the length of the involucre. Branches of the style in the ray-flowers included in the tube of the corolla, narrowly linear, glabrous, stigmatose to the summit; in the disk filiform, elongated, barbellate throughout. Achenia of the ray short, triangular, turgid, villous; of the disk very short, villous, rudimentary. Pappus of the ray double; the exterior of few unequal short squamellate bristles; the interior of numerous rather rigid barbellate-scabrous capillary bristles, somewhat longer than the achenium: pappus of the disk of 2 awn-like bristles, nearly the length of the corolla, somewhat dilated and chaffy towards the base.—An annual herb, sparsely hispid with rigid spreading hairs, and glandular-scabrous, with numerous slender and elongated branches. Leaves linear, very narrow, short, entire, involute when dry; the uppermost setaceous. Heads solitary, terminating the branchlets. Flowers apparently yellow.

B. hirtella.

Texas, *Drummond!*—Stem about 2 feet high, somewhat corymbosely branched. Leaves rather rigid, numerous, the lower ones about an inch long, apiculate, sparsely hispid, like the stem, with long bristly hairs arising from a rigid somewhat dilated base, and minutely glandular-scabrous. Heads pedunculate, as large as in Chrysopsis graminifolia. Involucre at length spreading; the scales nearly glabrous, shining, remarkably membranaceous, 1-nerved. Ray-flowers about 12; the achenia slightly obovate, 3-sided, rather large. Pappus of the disk-flowers of 2 (very rarely one) bristles or awns resembling those of Ageratum conyzoides: in one of them the chaffy base is occasionally wanting.—We are not sure that the ray is yellow: if it prove otherwise, the plant would belong to De Candolle's division Astereæ, subdivision Heteropappeæ. The style is nearly the same with that of Vernoniacæ.—We dedicate this remarkable genus to the memory of John Bradbury, who in the year 1811 ascended the Missouri to the Mandan villages, and made an interesting collection of plants, &c., a portion of which were published by Pursh in the supplement to his Flora. "In 1817, he published in London a journal of his travels in America during the years 1809–11, in which is contained a great deal of interesting information on the botany of the Missouri country." (*Short, on Western Botany.*) This work we have never met with.—*Bradburya* of Rafinesque's *Florula Ludoviciana*, is founded on Robins' description of two species of Glycine, one of which appears to be Centrosema Virginiana, the other perhaps a Galactia.

54. HETEROTHECA. *Cass. bull. philom.* 1817, & *dict.* 21. *p.* 130; *DC.*

Calycium, *Ell.*—Diplocoma, *Don.*

Heads many-flowered; the ray-flowers ligulate, pistillate, in a single series; those of the disk tubular, perfect. Scales of the involucre linear, appressed, or with somewhat spreading points, imbricated in few series. Receptacle alveolate, fimbrillate. Corolla of the ray with a slender tube and an oblong or linear ligule; of the disk slender, somewhat dilated at the throat, 5-toothed. Appendages of the style in the disk-flowers lanceolate, acute, or rarely triangular and obtuse, hispid. Achenia of the ray (sometimes glabrous) oval, mostly triangular, destitute of pappus; of the disk obovate or cuneiform, compressed, hairy, with a double pappus; the exterior of very short squamellate or somewhat chaffy bristles; the interior of numerous capillary scabrous bristles mostly in a single series.—Perennial? (N. American and Mexican) strigose or hirsute herbs, paniculately branched. Leaves ovate or lanceolate, toothed or serrate, sometimes sprinkled with resinous dots; the lower petioled and often furnished with a dilated auriculate or stipuliform base. Heads in terminal (and often also in smaller axillary) corymbose panicles. Flowers yellow. Pappus usually reddish or brownish.

1. *H. scabra* (DC.): stem hispid and scabrous; the branchlets glandular; leaves strigose, veiny, dentate-serrate; the upper lanceolate, closely sessile or partly clasping; the lower oval, coarsely and unequally serrate-toothed, obtuse or subcordate at the base, petioled; the petioles dilated at the base into a roundish foliaceous toothed lamina resembling adnate stipules; heads in a loose spreading or divaricate corymbose panicle; involucre somewhat pubescent and glandular, shorter than the pappus; rays oblong-linear; achenia of the ray glabrous; of the disk silky-villous; inner pappus reddish-brown, in a single series; the exterior squamellate-setaceous, white.—*DC.! prodr.* 5. *p.* 317. H. Lamarckii, *Cass. in dict. sci. nat.* 21. *p.* 131 (fide descr.); *DC.! l. c.* (excl. char. & syn. except Inula subaxillaris, *Lam.*) Inula subaxillaris, *Lam. dict.* 3. *p.* 259, ex spec. in *herb. Desf.* (fide *Cass.*) I. scabra, *Pursh! fl.* 2. *p.* 531. I. punctata, *Muhl. cat.* Chrysopsis scabra, *Nutt. gen.* 2. *p.* 151; *Ell.! sk.* 2. *p.* 339.

a. Calycium: achenia of the ray oblong, crowned with a manifest cup-shaped epigynous disk.—Chrysopsis scabra, *Ell.! l. c.*, &c. (Perhaps all the above synonymy belongs here.) Calycium, *Ell. l. c.*, in a note.

β. nuda: achenia of the ray broadly oval, the disk obscure.

Sandy soil and dry pastures, South Carolina! near the coast, to Western Louisiana! and Texas! Sept.-Oct.—All the specimens from South Carolina which we have examined present the "marginal cup" crowning the ray-achenia, as described by Elliott, to which his proposed generic name alludes; and this disk is uniformly nearly obsolete or very inconspicuous in our specimens from the Western States! The H. Lamarckii of De Candolle, as to the plant in his herbarium, we believe to be a state of the present species; but the character appears to be taken from the Chrysopsis divaricata of Nuttall and Elliott; who do not describe the ray-flowers as destitute of pappus, nor does the latter include that plant in his proposed genus Calycium, as De Candolle seems to have supposed. The oldest specific name, that of Inula subaxillaris, *Lam.*, is by no means appropriate, except to a particular

state of the plant, or when the corymb has been injured, in which case it often produces short axillary flower-branches.

2. *H. grandiflora* (Nutt.): very villous, glandular and viscid above; leaves oval-oblong, obtuse, sparingly toothed; the upper sessile or nearly so with a tapering base; the lower tapering into long and slender petioles, which are somewhat dilated at the base; involucre glandular-viscid; achenia of the ray pubescent, of the disk silky-pubescent; exterior pappus setose, short, inconspicuous.—*Nutt.! in trans. Amer. phil. soc. l. c. p.* 315. Diplopappus scaber, *Hook.! fl. Bor.-Am.* 2. *p.* 22.

"N. W. Coast, *Menzies! in herb. Hook.* (probably California?) and on rocks St. Barbara, California, *Nuttall!*—Heads larger than in H. scabra, but smaller than in H. inuloides; distinguished from the former by the character assigned, and by the short and triangular obtuse appendages of the styles; from the latter by the obtuse, densely villous, slightly toothed leaves, distinct exterior pappus, &c. In our specimen of H. inuloides (Mexico, *Hartweg*), the disk-flowers present an unequal pappus of copious capillary bristles, forming 2 or more series, but with no distinct squamellate or setose exterior pappus; thus holding the same relation to Aplopappus, that the other species do to Chrysopsis.

Subdiv. 5. CHRYSOPSIDEÆ, *DC.*—Pappus of the ray and disk similar, double; the exterior short; the inner copious, capillary.

55. CHRYSOPSIS. *Nutt. gen.* 2. *p.* 150 (§ of Inula), excl. spec.; *Ell. sk.* 2. *p.* 333; *DC. prodr.* 5. *p.* 326.

Heads many-flowered; the ray-flowers ligulate, pistillate, in a single series; those of the disk tubular, perfect. Scales of the involucre linear, imbricate. Receptacle somewhat alveolate, flat. Corolla of the disk-flowers tubular, 5-toothed. Branches of the style mostly terminated by linear or linear-subulate hispid appendages, often longer than the flat stigmatic portion. Achenia obovate or linear-oblong, compressed, hairy. Pappus of the disk and ray similar, double; the exterior short, squamellate-setose or somewhat chaffy; the interior of numerous elongated and scabrous capillary bristles. Perennial, rarely annual or suffrutescent plants (all North American), mostly villous, silky, or woolly; with oblong or linear usually entire and sessile leaves. Heads terminating the branches, often corymbose, showy. Flowers yellow.

§ 1. *Perennial: leaves gramineous or linear, nerved: achenia oblong-linear, at length attenuate at each end, or fusiform: exterior pappus setiform or somewhat squamellate-subulate.*—PITYOPSIS, Nutt.

1. *C. graminifolia* (Nutt.): thickly clothed with long closely appressed silky hairs; stem corymbosely branched above, leafy; leaves lanceolate or linear, gramineous, shining, nervose, entire; the uppermost and those of the branchlets very short, appressed; heads corymbose, or somewhat paniculate; scales of the turbinate involucre linear and lanceolate-subulate, pubescent and more or less glandular; achenia linear or linear-oblong, silky-pubescent; exterior pappus nearly setiform.—*Ell. sk.* 2. *p.* 334; *DC.! prodr.* 5. *p.* 326. Inula graminifolia, *Michx.! fl.* 2. *p.* 122; *Pursh, fl.* 2. *p.* 532; *Nutt.*

gen. 2. *p.* 151. Erigeron nervosum, *Willd.! spec.* 3. *p.* 1953. E. glandulosum, *Poir.* ex *DC.* Diplopappus graminifolius, *Less. in Linnæa*, 5. *p.* 310. D. sericeus, *Hook. compan. to bot. mag.* 1. *p.* 97. Pityopsis (Sericophyllum) graminifolia & argentea, *Nutt. in trans. Amer. phil. soc. (n. ser.)* 7. *p.* 318.

β. achenia rather shorter; stem less leafy towards the summit.—C. argentea, *Nutt. l. c.; Ell. l. c.; DC.! l. c.* Inula argentea, *Pers. syn.* 2. *p.* 452, ex *DC.* I. graminifolia *β.* tenuifolia, *Torr.! in ann. lyc. New York*, 2. *p.* 212.

Dry sandy soil, Delaware to Florida! Alabama! and Western Louisiana! July–Oct.—Stem 1–2 feet high, usually leafy throughout. Leaves with both surfaces similar and shining; the pubescence at length often partly deciduous; the leaves of the branches somewhat subulate. Heads variable in size. Pappus whitish or brownish.—This species varies considerably as to the size and breadth of the leaves; but C. argentea can scarcely be distinguished, even as a variety. In both forms the involucre is either manifestly or very slightly glandular, and sometimes a glandular pubescence takes the place of the silky hairs on the branchlets and peduncles.

2. *C. oligantha* (Chapman! mss.): stem simple, slender, glandular and naked above, bearing 2–4 heads; leaves lanceolate or spatulate-lanceolate, silky with closely appressed shining hairs, nervose, entire; heads on elongated naked peduncles; scales of the campanulate involucre subulate-lanceolate, glandular, somewhat pubescent; achenia linear, elongated, silky-villous; exterior pappus nearly setiform.

Damp pine barrens of Middle Florida, *Dr. Chapman!* April–May.—Stem 12–18 inches high, somewhat leafy and silky below the middle, but glandular and entirely naked or with a few minute bracts above. Leaves either elongated as in the preceding, or short and linear-spatulate, or even oblong and obtuse, on the same plant. Peduncles 2–4 inches long. Heads mostly larger than is usual in C. graminifolia—This is a vernal species, closely allied to the preceding, but perhaps sufficiently distinct. It cannot be the Inula argentea of Persoon, or of later authors: the achenium and pappus are wholly similar to the preceding.—We have seen Mexican specimens almost intermediate between this species and the preceding.

3. *C. pinifolia* (Ell.): nearly glabrous; stem rigid, branching; leaves crowded, narrowly linear, rigid, carinate-nerved; the uppermost setaceous; heads mostly solitary terminating the branchlets; inner scales of the involucre linear-lanceolate, somewhat membranaceous and lanate-ciliate at the apex; achenia linear, villous; exterior pappus somewhat chaffy or squamellate.—*Ell.! sk.* 2. *p.* 335; *DC.! prodr.* 5. *p.* 326. Erigeron retroflexum, *Poir. suppl.* 2. *p.* 464? Pityopsis pinifolia, *Nutt.! l. c.*

Sand-hills between the Flint and Chatahoochee Rivers, Georgia. *Elliott!* Sept.–Oct.—Stem 1–2 feet high. Lower leaves 4–6 inches long. Heads rather large. Exterior pappus very short, whitish; the interior reddish-brown.

4. *C. falcata* (Ell.): stem lanate-villous, often branched; leaves crowded, linear, mucronate, rigid, spreading or falcate, about 3-nerved, entire, hairy or at length nearly glabrous; heads (small) paniculate-corymbed; the pedicels slender; scales of the campanulate involucre villous-pubescent; achenia oblong-linear; exterior pappus setiform.—*Ell.! l. c. p.* 336 (note); *DC.! l. c.* Inula falcata, *Pursh, fl.* 2. *p.* 532. I. (Chrysopsis) Mariana, *β. Nutt.! l. c.* Pityopsis falcata, *Nutt.! in trans. Amer. phil. soc. l. c.*

Pine barrens, New Jersey! and Long Island, New York! Connecticut, *Dr. Robbins!* Nantucket, Massachusetts, *Mr. T. A. Green!* July–Sept.—Stems 6–10 inches high, stout, very leafy. Pappus cinnamon-colored.—A very distinct species.

§ 2. *Perennial: leaves oblong or lanceolate, somewhat veined: achenia obovate or oblong, compressed.*—EUCHRYSOPSIS.

* *Exterior pappus manifest, setose or squamellate-subulate.*

5. *C. Mariana* (Nutt.): villous with long and weak somewhat deciduous hairs; stem mostly simple, leafy; leaves membranaceous, oblong or elliptical, entire, or remotely mucronately serrulate, mucronulate, somewhat veiny; the uppermost closely sessile; the lower tapering to the base and somewhat petioled; corymb mostly simple; peduncles glandular; scales of the campanulate involucre linear, acute, somewhat glandular-viscid; achenia obovate, pubescent; exterior pappus setose-squamellate.—*Nutt.! l. c.; Ell.! sk.* 2. *p.* 335; *DC.! prodr.* 5. *p.* 327. Inula Mariana, *Linn. spec.* (*ed.* 2) 2. *p.* 1240; *Pursh, fl.* 2. *p.* 531. Aster Carolinianus pilosus, &c., *Mill. dict. t.* 57. Diplopappus Marianus, *Hook. compan. to bot. mag.* 1. *p.* 97; *Darlingt. fl. Cest. p.* 475.

Sandy and barren dry soil, New York? and New Jersey! to Florida! and Louisiana! common. Aug.–Oct.—Stem 1–3 feet high. Leaves villous with sparse very long and silky hairs, or sometimes nearly glabrous, mostly obtuse; the lower 3–5 inches long. Heads rather large. Pappus pale.

6. *C. trichophylla* (Nutt.): villous with very long and weak loose woolly hairs, glabrous towards the summit; stem simple or branched below, very leafy; leaves narrowly oblong or lanceolate, entire or obscurely serrulate, obtuse, somewhat mucronulate; the upper ones closely sessile, often nearly glabrous; the lower oblong-spatulate, veiny; corymb simple or compound, loose; the peduncles glabrous; scales of the hemispherical-campanulate involucre lanceolate-linear, acute or mucronate, glabrous or minutely glandular; the points often somewhat foliaceous and spreading; achenia oblong-obovate, obscurely ribbed, hairy or villous; exterior pappus nearly setiform.—*Nutt. gen.* 2. *p.* 150; *Ell. sk.* 2. *p.* 336; *DC.! prodr.* 5. *p.* 327.

β. hyssopifolia: radical leaves oblong-spatulate, in dense very woolly tufts; the cauline linear-spatulate or narrowly linear, sparingly pilose or glabrous; involucre glabrous.—C. hyssopifolia, *Nutt.! in jour. acad. Philad.* 7. *p.* 67. Diplopappus trichophylla? *Hook.! compan. to bot. mag.* 1. *p.* 97. (plant from Jacksonville.)

Dry soil, N. Carolina! to Florida! and Louisiana! *β.* Florida and Louisiana! Aug.–Oct.—Stem 1–3 feet high, sometimes simple and loosely corymbose at the summit, with few heads; often branched from the base, with a diffuse compound corymb. Heads about as large as in C. Mariana.—Well described as intermediate between the latter and C. gossypina; but distinguished from both by the much narrower leaves, glabrous branches and peduncles, more subulate appendages of the style, &c. The foliage varies through a variety of forms into var. *β.*; in which they are sometimes no more than a line wide, but variable in form, and either glabrous or hairy; so that we cannot define it as a separate species.

7. *C. gossypina* (Nutt.): very densely lanuginous-tomentose throughout; leaves oblong or elliptical, obtuse, entire; the upper ones closely sessile; the lower spatulate; heads corymbose or somewhat panicled; scales of the involucre lanceolate, acute, at first woolly; achenia obovate, hairy, somewhat ribbed; exterior pappus almost setiform.—*Nutt.! l. c.: Ell.! sk.* 2. *p.* 337; *DC.! prodr.* 5. *p.* 327. Inula gossypina, *Michx.! fl.* 2. *p.* 122: *Pursh, l. c.* I. glandulosa, *Lam. dict.* 3. *p.* 259, excl. syn., fide *DC.* Erigeron pilosum, *Walt.! Car. p.* 206.

β. dentata: lower leaves elongated, coarsely sinuate-toothed towards the summit.—C. dentata, *Ell.! l. c.*

Pine barrens &c., Virginia and N. Carolina! to Florida! *β.* Louisville, Georgia, *Elliott!* Aug.–Oct.—Stem 1–2 feet high. Lower leaves about 2

inches long. The whole plant remarkable for its thick and soft woolly covering. Heads rather larger than in C. Mariana. Pappus brownish. Achenia marked with 2–5 elevated ribs.

8. *C. scabrella:* pulverulent-scabrous throughout; stem stout, corymbosely branched above, leafy; leaves oblong-lanceolate, mucronulate, entire, equally somewhat glandular-scabrous on both sides, sessile; the lower ones narrowed at the base; heads numerous, in a compound corymb; peduncles and lanceolate obtuse scales of the involucre puberulent-glandular; achenia oblong-obovate, silky-villous; exterior pappus nearly setiform.

In pine woods, Florida, *Dr. Leavenworth!* Sept.–Oct.—Stem 2 feet high. Leaves about as large as in C. Mariana, but narrower, rather firm, totally destitute, as is the whole plant, of silky or woolly hairs. Corymb fastigiate, rather dense. Heads a little smaller than in C. Mariana. Pappus pale.

9. *C. villosa* (Nutt.): stem villous-pubescent and sparsely hirsute, erect, simple or corymbose, very leafy; leaves canescently strigose on both sides, mucronate, entire or rarely with a few sharp scattered teeth, hispidly ciliate towards the base, sessile; the upper ones linear-oblong or lanceolate, the lower oblong-spatulate, tapering at the base; heads solitary or somewhat corymbose at the extremity of the branches, on short peduncles; scales of the broadly campanulate involucre linear-subulate, strigosely pubescent; achenia obovate, villous; exterior pappus setose-squamellate.—*Nutt.! l. c.; DC. l. c.* Amellus villosus, *Pursh, fl. 2. p.* 564. Diplopappus villosus, *Hook.! fl. Bor.-Am. 2. p. 22, & compan. to bot. mag. 1. p. 97; Hook. & Arn.! bot. Beechey, p.* 146.

Prairies of Illinois! and the plains of the Missouri! Saskatchawan! &c. (also in Alabama, *Mr. Buckley!*) extending beyond the Rocky Mountains to Oregon, *Douglas!* California, *Capt. Beechey!* in *herb. Hook.* July –Sept.—Stems 1–2 feet high. Leaves an inch or more in length, 1-nerved, slightly veiny; the rigid pubescence closely appressed. Heads large. Rays about 25. Pappus tawny or nearly white. Appendages of the style subulate-linear, rather obtuse.

10. *C. hispida* (Hook.): hispid throughout with uniform spreading hairs; branches somewhat corymbose; leaves oblong-spatulate, narrowed at the base and somewhat petioled; the radical on long peduncles; scales of the involucre narrowly linear, acute; achenia obovate-oblong, hairy; exterior pappus squamellate.—*Hook.! fl. Bor.-Am. 2. p.* 22 (under Diplopappus); *DC. prodr. 7. p.* 279; *Nutt.! in trans. Amer. phil. soc. l. c. p.* 316.

On the Saskatchawan, *Richardson!* Rocky Mountains, *Nuttall!*—A smaller plant than C. villosa, (6–8 inches high), which it considerably resembles. Pappus tawny; the exterior rigid, white.—According to Nuttall, "there are numerous aromatic resinous glands spread over most part of the plant."

* * *Exterior pappus setose, indistinct: achenia oblong, densely silky-villous: plants canescent or silky-villous: leaves entire.* (Aplopappus § ? Leucopsis, *DC.*, at least in part.)

10. *C. mollis* (Nutt.): silky-canescent throughout; leaves spatulate-oblong, mostly obtuse; the upper sessile, the lower tapering to the base, somewhat petioled; heads few, corymbose; scales of the villous-canescent involucre linear-lanceolate.—*Nutt.! in trans. Amer. phil. soc. l. c.*

Plains of the Platte, with the following; "which it much resembles, but the leaves are more oblong, not in the least scabrous, nor anywhere ciliate; the stem also softly villous." *Nuttall.*—Except in the silky appressed pubescence, it closely resembles C. hispida.

11. *C. foliosa* (Nutt.): uniformly canescent with a soft silky-villous pubescence, and at the same time scabrous; stems very leafy to the summit; leaves oblong or elliptical, obtuse, mucronulate, not tapering to the base, closely sessile, or slightly clasping, with very scabrous margins; the lower sometimes fringed with bristles towards the base; heads fastigiate-corymbose, crowded, nearly sessile; involucre campanulate, canescent, rather shorter than the disk; the linear-subulate scales closely imbricated.—*Nutt.! in trans. Amer. phil. soc. l. c.*

Plains of the Platte, in the Rocky Mountains, *Nuttall!* Aug.—Stems many from the same root, a foot high, canescent with villous soft spreading hairs, but beneath this somewhat deciduous pubescence very scabrous. Leaves about an inch long, and half an inch wide, appressed silky, and also rough beneath this covering. Heads smaller than in C. villosa, with shorter rays. Pappus brownish.—Allied to the following.

12. *C. canescens:* silky-canescent throughout, suffrutescent at the base, much branched, rigid; stems and fastigiate branches very leafy; leaves linear-oblanceolate or spatulate-oblong, mucronate-acuminate, tapering to the base, sessile, fringed below the middle with long and scattered rigid bristles; heads mostly solitary terminating the crowded branchlets; scales of the campanulate involucre subulate-linear, closely imbricated, canescent.—Aplopappus? (Leucopsis) canescens, *DC.! prodr. 5. p. 349*; not Chrysopsis canescens, *DC. l. c. p.* 328, which is Erigeron (Pseuderigeron) filifolium.

Texas, *Berlandier! Drummond! Dr. Riddell!* Aug.–Sept.—Variable in the size and form of the leaves; those of the branchlets much smaller: the branches occasionally bear a few bristles like those so conspicuous on the margins of the leaves. Heads, involucre, and pappus (often ferruginous) nearly as in C. foliosa, *Nutt.* Rays rather numerous and short.

* * * *Exterior pappus chaffy but very minute; the inner nearly in a single series: heads subtended by foliaceous bracts similar to the upper leaves.* (Phyllotheca, *Nutt.*)

13. *C.? sessiliflora* (Nutt.): hirsute throughout with spreading viscid hairs; stem branched; leaves lanceolate or linear-oblong, acute, sessile, entire; heads solitary, shorter than the linear-lanceolate involucrate bracts; scales of the involucre linear-subulate, slender, rather longer than the disk.—*Nutt.! in trans. Amer. phil. soc. l. c. p.* 317.

St. Barbara, California, *Nuttall!* April.—2 Plant with "a heavy aromatic odor and bitter taste," clothed with slender viscid hairs, with shorter glandular hairs intermixed. Leaves an inch long. Rays about 30, narrow, elongated "with rudiments of stamina, or filaments. Appendages of the style oblong, obtuse, shorter than the stigmatic portion. Ovaries villous.

§ 3. *Annual: leaves oblong or lanceolate, somewhat veined; the lower often toothed: achenia obovate, compressed: exterior pappus of conspicuous rigid chaffy scales; the inner of* 25–30 *capillary bristles in a single series: receptacle convex.*—ACHYRÆA. (Subgen. Phyllopappus, *Nutt.*; not of *Walp.*)

14. *C. pilosa* (Nutt.): villous with very soft and loose partly deciduous hairs, and minutely viscid-puberulent; stem simple or loosely branched; leaves lanceolate; the upper closely sessile, acute or mucronulate, entire; the lowermost tapering to the base, often toothed; heads nearly solitary terminating the branches; scales of the hemispherical involucre narrowly linear, very acute, villous and viscid, almost equal, as long as the disk, achenia pubescent, obscurely impressed-striate.—*Nutt.! in jour. acad. Philad. 7. p.* 66, & *trans. Amer. phil. soc. l. c.*

Pine woods and open barrens, Arkansas, *Nuttall! Dr. Pitcher!* Louisiana, *Dr. Leavenworth! Dr. Hale! Dr. Carpenter!* Texas, *Drummond!* July–Sept.—Stem 1–2 feet high. Heads smaller than in C. villosa, with numerous elongated rays. Appendages of the style elongated-subulate, more than twice the length of the stigmatic portion. Inner pappus brownish; the exterior whitish, the scales linear-oblong, about one-third the length of the achenium, slightly denticulate, firm.—The lower leaves are sometimes laciniate-toothed or incised.

Subtribe BACCHARIDEÆ, *Less.*—Heads discoid, never radiate, diœcious or monœcious; the fertile flowers mostly filiform and truncate, and when monœcious in several series, with the sterile flowers in the centre. Receptacle not chaffy. Anthers not caudate at the base.—Leaves alternate.

56. CONYZA. *Linn.* (excl. spec.); *Less. syn. p.* 203.

Heads many-flowered, monœcious; the exterior pistillate and fertile, in many series, with a filiform truncate or 2–3-toothed corolla; a few of the central flowers staminate, sterile, but often styliferous or even fertile, with a tubular 5-toothed corolla. Scales of the involucre in several series. Receptacle flat or convex, punctate or fimbrillate. Achenia compressed, attenuate at the base, usually glabrous. Pappus a single series of capillary scarcely scabrous bristles.—Chiefly tropical herbs, with branching stems, and variously incised leaves. Heads peduncled, corymbose or paniculate. Flowers yellow.

1. *C. sinuata* (Ell.): annual? hairy, somewhat scabrous; lower leaves sinuate; the lobes oval, acute; the upper linear, entire; heads paniculate; scales of the involucre linear-subulate; flowers white, all fertile; achenia oblong, angled, hairy. *Ell. sk.* 2. *p.* 378.

Around Charleston, S. Carolina, very common. April–July.—The plant scarcely appears to be a native, and has the habit and appearance of an Erigeron. *Elliott.*—This plant is entirely unknown to us and is probably not indigenous. It appears to belong to Conyza sect. Dimorphanthes, the American species of which frequently have the central flowers perfect and fertile.

C. Chilensis, Spreng. According to De Candolle, a specimen of this plant in Hænke's collection is said to have been obtained at Mulgrave Sound on the Pacific coast; but there is doubtless some mistake as to the ascribed habitat of this and many other of Hænke's plants.

57. BACCHARIS. *Linn.*; *Michx. fl.* 2. *p.* 125; *DC. prodr.* 5. *p.* 398.

Heads many-flowered, diœcious; the flowers all tubular and similar. Involucre somewhat hemispherical or oblong; the scales imbricated in several series. Receptacle naked, or rarely somewhat chaffy. Corolla in the sterile flowers somewhat dilated and 5-cleft at the summit; in the fertile filiform, somewhat truncate. Anthers exserted in the sterile flowers; entirely absent in the fertile. Style in fertile flowers exserted; the branches glabrous; in the sterile tipped with an ovate hairy appendage, often more or less abortive. Achenia ribbed or grooved. Pappus capillary; of the sterile plant in a sin-

gle series, often tortuous or somewhat plumose-penicillate, about the length of the involucre; of the fertile plant in one or several series, not thickened or penicillate at the apex, usually much longer than the involucre.—Shrubs, very rarely herbs (nearly all American), commonly glabrous and resinous, or viscous. Leaves mostly alternate, entire or toothed, often decurrent on the branches, forming either a foliaceous wing or narrow margins. Flowers mostly white.

* *Natives of the United States.*

1. *B. angustifolia* (Michx.): glabrous, much branched; the branchlets angled; leaves narrowly linear, sessile, entire, rather acute; heads about 20-flowered, axillary, pedunculate, and somewhat clustered at the summit of the branches, forming a loose panicle; scales of the involucre ovate-lanceolate, acute.—*Michx.! fl.* 2. *p.* 125; *Pursh, fl.* 2. *p.* 523; *Ell.! sk.* 2. *p.* 318; *DC.! prodr.* 5. *p.* 423.

Sea-coast, S. Carolina! to Florida! and Louisiana! Sept.–Oct.—Shrub 6–10 feet high. Heads small.

2. *B. halimifolia* (Linn.): arborescent, glabrous, somewhat scurfy-glaucescent; the branches angled; leaves obovate, coarsely angulate-toothed above, cuneate at the base and somewhat attenuate into a petiole; the uppermost lanceolate, entire; heads of the sterile plant subglobose, pedicellate, solitary or aggregated; the fertile loosely somewhat panicled ovate-oblong; scales of the sterile involucre ovate; the inner ones elongated in the fertile. *DC.—Linn.! spec.* 2. *p.* 860; *Michx.! fl.* 2. *p.* 125; *Pursh, fl.* 2. *p.* 523; *Ell.! sk.* 2. *p.* 319; *Duham. arb.* (*ed.* 2) 1. *t.* 60; *DC.! prodr.* 5. *p.* 412. Senecio Virginianus arborescens, *Herm. parad. Bat. t.* 225. Elichryso affinis, &c., *Pluk. alm. t.* 27, *f.* 2.

Sandy beach of Connecticut! New York! and New Jersey, and throughout the low country of the Southern States! "growing indiscriminately in fresh or brackish soils," *Ell.* Sept.–Oct.—Shrub 6–12 feet high. Pappus of the fertile flowers very long and slender.

3. *B. glomeruliflora* (Pers.): shrubby, very glabrous; the branches angled; leaves smooth, cuneate-obovate, attenuate into a short petiole, obtuse, coarsely toothed; the uppermost obovate-oblong, entire; heads sessile and crowded in the axils of the leaves; the sterile involucre campanulate, with the scales oblong and obtuse. *DC.—Pers. syn.* 2. *p.* 423; *Pursh, l. c.* B. sessiliflora, *Michx.!* 2. *p.* 125; *Ell. sk.* 2. *p.* 320; not of *Vahl.*

Damp pine barrens along the sea-coast, (but not in brackish soils, *Ell.*) Virginia to Florida! and Louisiana! Sept.–Nov.—Shrub 3–5 feet high. Leaves pale green. Pappus of the fertile flowers very long, as in the preceding.—De Candolle, from whom we have taken the characters of this species and B. halimifolia, places the two at considerable distance from each other; and authors appear to have no doubt of their distinctness: but, if indeed we are truly acquainted with the present species, we cannot distinguish them.

4. *B. salicina:* "shrubby, smooth; branches angular; leaves mostly oblong-lanceolate, subdenticulate; the uppermost nearly linear, entire, viscid; heads sessile, clustered; involucre ovate, as well as the smooth scales." *Nutt. in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 337, under the name of B. salicifolia, which is pre-occupied by Persoon. B. aff. rupicola, *Torr.! in ann. lyc. New York*, 2. *p.* 211.

Banks of the Arkansas.—Nearly allied to B. glomeruliflora. More or less resinously punctate. Leaves very obscurely 3-nerved, attenuated into a petiole. *Nuttall.*—Dr. James collected this plant on the Canadian, but his spe-

cimens are not sufficient to allow of our offering any opinion respecting the species.

* * *Natives of California.*

5. *B. consanguinea* (DC.): shrubby, much branched, glabrous, viscous when young; the branchlets decurrent-angled; leaves sessile, obovate-cuneiform, obtuse, with 2–4 rigid acute teeth on each side; heads sessile at the summit of the branches and branchlets, solitary, or mostly aggregated in glomerules of 2–4; scales of the involucre in the fertile heads oblong-linear, obtuse, with a membranaceous somewhat fimbriate margin; the innermost rather acute. *DC. prodr.* 5. *p.* 408; *Hook. & Arn. bot. Beechey, suppl. p.* 352. B. glomeruliflora, *Hook. & Arn. l. c. p.* 147, excl. var. *β.* (which these authors now refer to B. pilularis.)

California, *Menzies, Douglas*, &c.—Leaves 6 lines long, about 3 broad, slightly scaly above, *DC.*—Hooker & Arnott still doubt whether this species be really distinct from B. glomeruliflora, or from B. pilularis.

6. *B. pilularis* (DC.): somewhat shrubby, much branched, glabrous and viscous; the branches angled; leaves sessile, obovate-cuneiform, obtuse, entire, or often slightly toothed, 1-nerved, coriaceous; heads globose, solitary at the summit of the branches on the axillary branchlets, bracteate with minute leaves; scales of the involucre in the sterile plant oblong, rather acute, the margin membranaceous and somewhat fimbrillate at the apex. *DC. prodr.* 5. *p.* 407; *Nutt. in trans. Amer. phil. soc. l. c.*

California, *Douglas, Nuttall!*—Leaves 4 lines long, and 2–3 broad; the uppermost shorter than the heads. Heads about 2 lines in diameter. Fertile plant unknown. *DC.*—"In my specimens of the fertile plant, the leaves are often strongly denticulate, three-fourths of an inch long, by half an inch in width: the capituli solitary or by threes. . . . Achenia smooth with 10 grooves, the pappus of moderate length. A shrub 3 or 4 feet high. It appears to be subject to the attack of some insect, which causes excrescences on the branches; and hence, I suppose, arises the specific name." *Nutt. l. c.*

7. *B. Douglasii* (DC.): herbaceous, erect, very glabrous, viscid; stem simple, angled above; leaves on short petioles, lanceolate, acute, entire, 3-nerved, both sides punctate; corymb in the sterile plant compound, somewhat naked, fastigiate, bearing numerous heads; involucre campanulate; the scales lanceolate, rather acute, with membranaceous ciliate margins. (Leaves 2 inches long, 5–6 lines wide, the upper narrower; pappus of the sterile flowers whitish, as long as the involucre.) *DC. prodr.* 5. *p.* 400. B. glutinosa, *Hook. & Arn. bot. Beechey, p.* 147, & *suppl. p.* 352. under B. Douglasii, and by mistake printed *viscosa*. B. Pingræa, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 337. Molina linearis, *Less. in Linnæa*, 6. *p.* 139 & 505.

California, *Chamisso, Capt. Beechey, Douglas, Nuttall!*—This plant, which Lessing and Nuttall take for B. Pingræa, Hooker and Arnott remark that they are still unable to distinguish from the Chilian B. glutinosa.

8. *B. viminea* (DC.): shrubby, glabrous; branches terete, the branchlets striate-nerved; leaves on short petioles, oblong-lanceolate, acute at each end, slightly 3-nerved at the base, entire, or minutely denticulate at the apex; corymbs somewhat racemose, crowded, terminating the branchlets; heads of the sterile plant pedicellate; the scales of the involucre oval-lanceolate, acute, membranaceous, ciliate. *DC. prodr.* 5. *p.* 400; *Hook. & Arn. l. c.*

California, *Douglas*,—Fertile plant unknown. Leaves 12–14 lines long, those of the branchlets short and scale-like. Pappus of the sterile flowers scarcely longer than the involucre. *DC.*

Subtribe 3. TARCHONANTHEÆ, *Less.*—Heads discoid, never radiate, diœcious or heterogamous; the fertile flowers tubular-filiform, mostly truncate, when heterogamous with the perfect or staminate flowers in the centre. Receptacle sometimes chaffy. Anthers caudate at the base.—Leaves alternate.

CONSPECTUS OF THE GENERA.

* *Pappus of the sterile and fertile flowers similar, capillary.*

58. PLUCHEA. Involucre persistent. Heads in compound corymbs.
59. PTEROCAULON. Involucre deciduous. Heads spicate. Leaves decurrent.

* * *Pappus of the sterile and fertile flowers none. Receptacle flat or conical.*

\+ Flowers all fertile.

60. CALYMMANDRA. Achenia of the perfect flowers only enclosed by the chaff.

\+ \+ Staminate flowers few, sterile.

61. FILAGINOPSIS. Fertile flowers numerous, in the axils of narrow equal chaff.
62. DIAPERIA. Fertile flowers 8–12, in the axils of broad unequal concave chaff.
53. MICROPUS. Fertile flowers 5–7, enclosed in rigid gibbous scales.
64. PSILOCARPHUS. Fertile flowers numerous, enclosed in membranous chaff.

* * * *Pappus of the sterile flowers of few bristles. Receptacle columnar.*

65. STYLOCLINE. Achenia numerous, enclosed in the saccate keel of the broad chaff.

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58. PLUCHEA. *Cass. bull. philom.* 1817, *p.* 31; *DC. prodr.* 5. *p.* 449.

Stylimnus & Gynema, *Raf.* (1819.)—Leptogyne, *Ell.* (1824.)

Heads many-flowered; the central flowers mostly perfect, but sterile; the others filiform, pistillate, in many series. Involucre imbricated. Receptacle flat, mostly naked. Corolla of the fertile flowers truncate, or minutely 2–3-toothed; of the sterile dilated and 5-cleft at the summit. Anthers bicaudate. Style in the central flowers entire or minutely 2-toothed. Achenia somewhat cylindrical, angled or grooved. Pappus capillary, in a single series, slightly scabrous.—Herbs, or rarely suffrutescent plants (mostly subtropical), glandular, emitting a strong and somewhat disagreeable odor. Leaves oval or oblong, serrate. Heads in compound corymbs. Flowers mostly purplish.

1. *P. bifrons* (DC.): pubescent and slightly viscid; leaves oval or lanceolate-oblong, somewhat cordate and clasping at the base, mucronately serrulate, reticulate-veined, sprinkled with resinous globules; heads in compact fastigiate corymbs.—*DC.! prodr.* 5. *p.* 451. Conyza bifrons, *Linn. spec.* 2. *p.* 862 (excl. var. radiata); *Pursh, fl.* 2. *p.* 524; *Ell. sk.* 2. *p.* 322; *Hook. compan. to bot. mag.* 1. *p.* 96. C. amplexicaulis, *Michx.! fl.* 2. *p.* 126. *β.* uliginosa, *Pers.*, ex *DC.* Baccharis viscosa, *Walt.! car. p.* 202.

Wet places in the low country, from South Carolina! to Florida! and

Louisiana! July.–Sept.—2 Stem 2–3 feet high. Leaves 2–3 inches long, rather acute. Flowers dull purple.

2. *P. fœtida* (DC.): stem minutely pubescent; leaves (large) oval-lanceolate, very acute or acuminate at each end, distinctly petioled, membranaceous, almost glabrous, conspicuously feather-veined, serrate; corymbs compound, paniculate; scales of the involucre glabrous, dotted with minute glands.—*DC.! prodr.* 5. *p.* 452. (excl. syn. *Pursh & Cass.?*) P. petiolata, *Cass. in dict. sci. nat.* 42. *p.* 2? Baccharis fœtida. *Linn. spec.* 2. *p.* 861, at least as to syn. *Dill. Elth. t.* 89, *f.* 105. Conyza camphorata, *Pursh, fl.* 2. *p.* 523; *Nutt. gen.* 2. *p.* 145, not of *Ell.?* nor Erigeron camphoratum, *Linn.* Gynema dentata & viscida, *Raf.! ann. nat. p.* 159 & *in herb. DC.*

Along streams, &c. Pennsylvania? to Alabama! and throughout the Western States! Aug.–Oct.—2 Stem strongly grooved or angled, 2–4 feet high: the plant exhaling a more powerful odor than the following species. Leaves 5–8 inches long, and 1–3 broad, pubescent beneath, especially on the veins, and copiously sprinkled with minute resinous globules, very veiny. Heads numerous: the involucre at first rather longer than the disk.—We are somewhat uncertain as to the plant of Clayton on which the Baccharis fœtida of Linnæus was partly founded; but the figure of Dillenius here cited doubtless was intended for this species. The Erigeron camphoratum, *Linn. hort. Ups. &c.* is pretty clearly the following. We therefore retain the synonymy of De Candolle, but reduce two of his species to one.

3. *P. camphorata* (DC.): minutely viscid-pubescent and glandular; leaves lanceolate-ovate or oblong-ovate, serrile or slightly petioled, pale and minutely pubescent and sprinkled with resinous globules both sides, slightly feather-veined, repandly serrate; corymbs fastigiate; scales of the involucre pubescent and viscid, ciliate.—P. camphorata & P. Marilandica, *DC.! l. c.* P. Marilandica, *Cass. l. c.?* Erigeron camphoratum, *Linn. spec.* 2. *p.* 864; *Willd.! spec.* 3. *p.* 1960. Conyza Marilandica, (*Dill. Elth. t.* 88, *f.* 104?) *Michx.! fl.* 2. *p.* 126; *Pursh! l. c.; Nutt. l. c.; Ell. sk.* 2. *p.* 320. C. camphorata, (*Ell. l. c.?*) *Bigel. fl. Bost. ed.* 2. *p.* 299, not of *Pursh, &c.* Baccharis fœtida, *Walt.?* Stylimnus maritimus, *Raf.! in herb. DC.*

β. angustifolia: leaves lanceolate, obscurely serrulate or entire.—Conyza angustifolia, *Nutt.! in jour. acad. Philad.* 7. *p.* 109.

Salt marshes, Massachusetts! to Florida! and Louisiana! Aug.–Oct.—① Stem 10–30 inches high. Leaves slightly succulent, 2–3 inches long. Heads fewer and larger than in the preceding; the purplish involucre at length shorter than the disk. Flowers light purple.

4. *P. purpurascens* (DC.): herbaceous, somewhat viscidly puberulent; leaves ovate-lanceolate, rather acute, unequally serrate, tapering into a petiole, minutely puberulent and glandular, somewhat veiny; heads subglobose, pedicellate, in loose corymbs; scales of the involucre pubescent-tomentose and viscid; the exterior ovate, the inner oval-lanceolate, somewhat spreading. *DC. prodr.* 5. *p.* 452.—Conyza purpurascens, *Swartz, prodr. Ind. Occ. p.* 112?

Key West, *Mr. Blodgett!*—Apparently a rather small annual herb; with much the habit and appearance of C. camphorata, the leaves about the same size, but narrower; the cauline ones tapering into distinct petioles. As we have seen specimens of the same species from St. Domingo, we have little doubt that it is De Candolle's P. purpurascens, and most probably his P. glabrata also.

Conyza Caroliniensis of Jacquin is referred by De Candolle to Pluchea (Conyza, *Linn.*) odorata, a shrubby West Indian and Mexican, but certainly not a Carolinian species.

59. PTEROCAULON. *Ell. sk.* 2. *p.* 333 (1824); *DC. prodr.* 5. *p.* 453.

Heads many-flowered; the fertile flowers filiform, pistillate, in several series; the perfect flowers in the centre (or intermixed with the others, *Ell.*), mostly sterile. Scales of the oblong involucre imbricated in several series, appressed or with slightly squarrose points, caducous. Receptacle minutely fimbrillate or hirsute. Corolla of the fertile flowers 3-toothed; the sterile 5-cleft at the summit. Anthers bicaudate, somewhat exserted. Achenia angled, pubescent with appressed hairs. Pappus of numerous capillary scabrous equal bristles, longer than the involucre.—Perennial herbs, or slightly shrubby plants (chiefly natives of tropical America), with a somewhat tuberous rhizoma. Leaves alternate, lanceolate, entire or denticulate, very densely tomentose beneath, the margins decurrent along the stem into continuous foliaceous wings. Heads sessile, densely crowded in simple or compound spikes. Flowers usually white.

1. *P. pycnostachyum* (Ell.): stem herbaceous, simple; leaves lanceolate, undulate-denticulate, glabrous above; heads in a dense continuous spike; scales of the involucre silky-tomentose, squarrose at the apex.—*Ell. l. c.*; *DC.! l. c.* Conyza pycnostachya, *Michx.! fl.* 2. *p.* 126; *Pursh! fl.* 2. *p.* 524. Chlænolobus pycnostachyos, *Cass. in dict. sci. nat.* 49. *p.* 348 (1827). Pluchea pycnostachya, *Less.* Gnaphalium undulatum, *Walt.! Car. p.* 203.
Dry sandy soil, S. Carolina! to Florida! May–Aug.—*Black Root.* (The root is much used in some parts of the country as an alterative, and as a cleanser of old ulcers. *Elliott.*)

60. CALYMMANDRA.

Heads subglobose, subsessile, collected in small axillary clusters, many-flowered, heterogamous; the flowers all fertile; the pistillate in many series, in the axils of narrow and plane linear or somewhat spatulate scarious (villous-lanate) chaff of the receptacle, with a filiform truncate corolla; the perfect 5 in a single central series, each enclosed in an oval convolute woolly chaff; the short and somewhat inflated minutely 4-toothed corolla more or less exserted. Scales of the involucre few, similar to and passing into the chaff. Receptacle conical, punctate. Anthers with very short tails. Branches of the style short; in the perfect flowers oblong, flat; in the pistillate filiform. Achenia oval-oblong, nearly terete, very smooth, destitute of pappus, those of the perfect flowers similar, but enclosed by the subtending chaff.—A small annual herb, branched from the base, clothed with a very white and silvery appressed wool; the branches slender, somewhat simple, erect, bearing small bracteate or irregularly involucrate clusters of few heads, closely sessile in the axils of linear-oblanceolate or narrowly spatulate entire leaves; the heads themselves (about a line long) on short pedicels concealed by the wool.

C. candida.

Texas, *Drummond!*—Plant 5–10 inches high. Leaves alternate, approximate, half an inch or more in length, very much longer than the clusters in

their axils. Chaff falling away when the achenia ripen, all nearly equal in length, scarious, glabrous towards the base, that of the perfect flowers woolly throughout, somewhat herbaceous, obtuse, shorter than the flowers, but investing the achenia, just as those of Micropus are enclosed by the scales of the involucre. In the latter, the exterior and pistillate flowers are thus invested: in this remarkable genus, on the contrary, the central staminate (and fertile) flowers are enclosed, to which circumstance the generic name alludes.

61. FILAGINOPSIS.

Heads subglobose-ovoid, collected in dense umbelliform clusters, many-flowered; the fertile flowers pistillate, numerous, and in many series in the axils of the linear-oblong and obtuse (woolly-tipped) flat and scabrous equal chaff of the receptacle, with a filiform truncate corolla; the 2–5 central staminate, with a tubular-infundibuliform 4-toothed corolla, sessile and with no vestige of an ovary, subtended by as many of the chaffy scales of the receptacle, and nearly equalling them in length. Involucre of few scales entirely similar to the chaff of the receptacle, and only distinguishable by having no flowers in their axils: involucrate bracts mostly 5, in a single series, obovate-spatulate, herbaceous, with scarious margins, very woolly. Receptacle flat or somewhat convex, papillose-punctate. Style in the staminate flowers undivided; in the fertile with short filiform branches. Achenia oval, smooth and glabrous, slightly obcompressed (that is parallel with the chaff), entirely destitute of pappus.—Annual woolly herbs, with the aspect of Filago (natives of Mexico and Texas), much branched from the base, diffuse. Leaves oblong-spatulate, entire, sessile. Heads in involucrate (simple or proliferous) woolly glomerules, terminating the branches.

This genus differs from Evax in the broad and flat receptacle, obtuse chaff, &c.; from the Diaperia of Nuttall in the roundish very many-flowered heads, the narrow chaff numerous in each series, the sessile sterile flowers, &c.

1. *F. multicaulis:* glomerules often proliferous; chaff of the sterile flowers linear-spatulate, somewhat herbaceous and woolly throughout, slightly involving the entirely glabrous corolla.—Evax multicaulis, *DC.! prodr. 5. p.* 459. E. verna, *Raf.! herb.*

Texas, *Berlandier! Drummond!* Dr. *Leavenworth!* (the former also obtained it in Mexico.)—Plant 3–6 inches high, with rather slender diffuse stems and branches, clothed with long loose wool. Leaves one-fourth to half an inch long; the involucrate ones unequal and often shorter than the irregular clusters. Heads ovoid; the chaff all but the inner series glabrous except at the summit, where the long wool is densely matted and coherent, while the base separates from the receptacle when the achenia are mature.

2. *F. Drummondii:* glomerules seldom proliferous: chaff of the sterile flowers entirely similar to that of the fertile, or wanting; the corolla (sterile), like the chaff, clothed with long woolly hairs at the summit.

Texas, *Drummond!*—Plant 4–8 inches high, more loosely branched than the preceding, which it exceedingly resembles. Heads fewer in a cluster and rather larger, very many-flowered, hemispherical-obovoid; the oblong-linear chaff all similar and of the same length, clothed towards the tips with

rather shorter wool, so that they separate readily when they fall away; the 4 or 5 sterile corollas naked, connected by the crisped woolly hairs which grow on the dilated limb.

62. DIAPERIA. *Nutt. in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 337.

Heads fusiform-oblong, disposed in sessile glomerules of 4–5 together, which are collected in large capitate and bracteate compound clusters terminating the stem or simple and mostly proliferous branches; the fertile flowers 8–12, pistillate, in the axils of the chaff of the receptacle, with a much attenuated filiform truncate corolla; the 2–3 central staminate, with a tubular-infundibuliform minutely 4-toothed corolla, destitute of ovaries, each supported by a filiform stipe and enclosed in a chaff of the receptacle. Scales of the involucre and the chaff of the small convex receptacle scarious, oval, broad and large for the size of the head, closely and somewhat distichously imbricated and wrapped around each other, the inner successively longer; the 2–3 innermost chartaceous, attenuate at the base, woolly towards the apex, each convolute and separately enclosing a sterile flower. Style in the sterile flowers undivided; in the fertile with 2 filiform branches. Achenia obovoid-oblong, obcompressed, glabrous, destitute of pappus.—A small annual erect woolly herb, with spatulate-oblong or linear-spatulate numerous sessile entire leaves; the stems simple or often branched from the base, terminated by the large irregularly involucrate compound head; from which arise 1 to 5 or 6 simple branches, terminated by simple but usually smaller compound heads, in the manner of the *Herba impia*; and these rarely again proliferous. Proper heads and primary clusters more or less bracteate.

D. prolifera (Nutt.! l. c.)—Evax prolifera, *Nutt.! in DC. prodr.* 5. *p.* 459.

Banks of Red River, Arkansas, *Nuttall! Dr. Leavenworth!* June–Aug.—Stems stout, rigid, 2–5 inches high, terminated by a capitate cluster one-half to three-fourths of an inch in diameter, including a large number of small heads: some of the branches when numerous often arising below this compound head. Scales of the involucre few, entirely similar to the chaff, and passing into the latter, but shorter, and woolly externally: the chaff of the fertile flowers glabrous or slightly tomentose-ciliate: that of the sterile longest and more rigid, much longer than the slender corolla it encloses; the filiform stipe of the latter fully half its own length.

63. MICROPUS. *Linn.; Gærtn. fr. t.* 164; *Schkuhr, handb. t.* 267.

Heads collected in axillary sessile clusters, several-flowered; the fertile flowers 5–7, in a single series, pistillate, with a filiform corolla, enclosed in the inner scales of the involucre; the 3–7 central staminate, with an infundibuliform 5-toothed corolla, naked, destitute of ovaries. Receptacle small and flat. Involucre in 2 series, each of 5–7 scales; the exterior scarious, flattish, spreading, bracteiform; the interior (perhaps rather to be considered chaff of the receptacle, as described by Nuttall) infolded and laterally compressed,

boat-shaped and very gibbous, enclosing the fertile flowers, and forming a permanent cartilaginous covering to the smooth obovate and gibbous compressed achenia. Pappus none.—Low woolly herbs with the aspect of Filago or Gnaphalium.

§ *Fructiferous scales of the involucre not echinate, woolly when young.*—Bombycilæna, *DC.*

1. *M. Californicus* (Fisch. & Meyer): clusters lateral and terminal; fructiferous scales compressed-navicular, semi-obcordate; the inner margin straight, terminated by an erect mucroniform appendage with a scarious apex.—*Fisch. & Meyer, ind. sem. St. Petersb.* 1835, *p.* 42; *DC. prodr.* 7. (*mant.*) *p.* 283.

β. angustifolia: slender; leaves linear, acute; heads very woolly when young; exterior or bracteate involucral scales oval, concave, scarious with a linear green centre.—M. (Rhyncholepis) angustifolius, *Nutt.! in trans. Amer. phil. soc. l. c.*

California at Bodega, *Fischer & Meyer.* *β.* St. Barbara, *Nuttall!*—Said to resemble M. erectus, but the heads with a more scattered and shorter wool; while Mr. Nuttall's plant is more slender than that species, the young heads with a longer wool; but the fruit &c. exactly corresponding to the character of the Russian botanists, who do not notice the leaves, &c. Perhaps there are two nearly allied Californian species.

64. PSILOCARPHUS. *Nutt. in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 340.

Heads solitary or clustered, many-flowered; the fertile flowers 8–30 in several series, pistillate, with a filiform corolla, each enclosed in an involute involucral scale or chaff of the receptacle; the 5–8 central staminate, with a dilated infundibuliform 4–5-toothed corolla, destitute of ovaries, naked. Receptacle subglobose; the chaff and similar involucral scales (as the outermost may be deemed) membranaceous, woolly, reticulated, infolded, and cucullate, forming thin obovoid or somewhat gibbous loose coverings to the very smooth oblong terete or slightly compressed achenia. Branches of the style short and filiform, in the sterile flowers minutely hairy. Pappus none.—Very small diffusely branched and depressed woolly annuals, with the aspect of Evax, &c. (natives of the western coast of America); with linear or spatulate-oblong entire and sessile leaves, which are alternate, and irregularly involucrate around the terminal or lateral sessile heads or clusters.

This certainly distinct genus is well described by Nuttall: except that, although he mentions a beak or uncinate tips to the fructiferous chaff in some species, he has not alluded to the true structure of this inconspicuous appendage, which in fact exists in all the species. It consists of a small hyaline scale, forming the organic apex of the fruit-enclosing chaff, and, as it were, articulated with it at the summit of the anterior fissure: at first it is erect or spreading: but after impregnation it is more or less inflexed, covering the fissure like an operculum. In P. tenellus, this scale is broad, ovate, and nearly as large as the chaff itself at the time of impregnation: in P. Oreganus it is similar in form, and in the full-grown chaff about half the length of the fissure; in P. globiferus and the nearly allied P. brevissimus, it is smaller in proportion to the chaff, ovate-oblong, and apparently somewhat deciduous.

1. *P. globiferus* (Nutt.! l. c.): very woolly, decumbent, much branched;

leaves oblong-linear, the floral ones broader, obtuse; fertile flowers 20 or more; the obovoid inflated fructiferous chaff forming globose very woolly heads, lateral and terminal.—Micropus globiferus, *Bertero, in DC. prodr.* 5. *p.* 460 *?*

St. Barbara, California, *Nuttall!* April.—"Plant not an inch high, spreading out 5 or 6 inches:" the woolly bracteate heads numerous, nearly one-fourth of an inch in diameter; the woolliness of the leaves somewhat deciduous: the inflated fruit-bearing chaff between 1 and 2 lines long.—Also a native of Chili, if it is really the Micropus globiferus of Bertero, which is uncertain, although that species doubtless belongs to this genus.

2. *P. brevissimus* (Nutt.! l. c.): stem minute, simple, producing mostly a single very woolly head; fertile flowers 8–10; the fructiferous chaff obovoid-oblong; leaves oblong-lanceolate, acute.

"Plains of the Oregon River, in inundated tracts.—Extremely dwarf (perhaps not always so): about 4 lines high; the solitary capitulum, though rather large, sessile on about the third set of leaves, and so downy as to look like a pellet of cotton." *Nuttall.*—Very nearly allied to the preceding. Mr. Nuttall suspects it may possibly prove to be the Micropus minimus of De Candolle.

3. *P. Oreganus* (Nutt.! l. c.): canescently tomentose throughout, diffusely branched and procumbent; leaves linear; fertile flowers 20 or more; fructiferous scales obovoid, tomentose.

"Inundated places, near the Oregon and the outlet of the Wahlamet.—Nearly allied to P. globiferus; but with much narrower leaves; with none of the long arachnoid hairs of that species; the scales of the receptacle also smaller." *Nuttall.*

4. *P. tenellus* (Nutt.! l. c.): tomentose-canescent; the base of the ascending clustered stems and the lower leaves becoming glabrous; lower leaves spatulate-linear; the upper and floral ones oblong-spatulate; heads small, mostly terminal; fertile flowers 20 or more; fructiferous scales obovoid-oblong, gibbous, tomentose.

St. Barbara, California, *Nuttall!* April.—Plant 1–2 inches high, with the stems slender. Heads about 2 lines in diameter. Achenia acute at each end.

65. STYLOCLINE. *Nutt. in trans. Amer. phil. soc. (n. ser.)* 7. *p.* 338.

Heads subglobose, many-flowered; the fertile flowers pistillate, in several series included in a carinate fold of the chaff of the receptacle, with a very slender and filiform truncate corolla; the 3–4 central staminate, with a tubular minutely 5-toothed corolla, destitute of ovaries, naked. Receptacle slender and elongated, cylindrical; the chaff imbricated, broadly ovate, concave, scarious, with a green herbaceous carinate-saccate keel in which the fertile flowers are enclosed, woolly towards the base; the scales of the involucre about 5, similar, but destitute of the saccate keel. Achenia very smooth, somewhat laterally compressed, acute at the base, slightly lunate. Pappus of the fertile flowers none; of the sterile composed of 3–5 barbellate-scabrous bristles as long as the corolla.—An annual tomentose woolly low herb, diffusely branched and decumbent, with small linear entire sessile leaves. Heads (about 3 lines in diameter, yellowish-white) in sessile clusters of 3–5 together at the extremity of the branches and in the upper axils.

S. gnaphaloides (Nutt.! l. c.)

Near Monterey, California, *Nuttall!*—Plant about 6 inches high.—Chaff, including the minute achenia, at length deciduous from the slender spirally punctate receptacle.—The fertile flowers have the same corolla as the preceding genera; and what Mr. Nuttall describes as a few long chaffy hairs produced at the apex of the receptacle, is the pappus of the sterile flowers.

Subtribe 4. INULEÆ, *Cass.*—Heads mostly radiate and heterogamous, never diœcious. Receptacle not chaffy. Anthers caudate at the base.—Leaves alternate. Heads not glomerate. Ray-flowers of the same color as the disk.

66. INULA. *Linn.*; *Gærtn. fr. t.* 170; *DC. prodr.* 5. *p.* 463.

Heads many-flowered; the ray-flowers in a single series, pistillate, but sometimes infertile, ligulate, or rarely somewhat tubular; those of the disk tubular, perfect. Involucre imbricate in several series. Receptacle flat or somewhat convex, naked. Anthers bisetose at the base. Achenium terete or 4-sided. Pappus a single series of capillary slightly scabrous bristles.—Mostly perennial herbs (natives of Europe and Asia), with the cauline leaves often clasping. Heads solitary or corymbose at the summit of the peduncles. Flowers yellow.

§ *Exterior scales of the involucre broadly ovate, foliaceous; the inner obovate-spatulate, obtuse: achenia 4-sided, glabrous; rays ligulate, numerous, narrowly linear.*—CORVISARTIA, Merat, Cass.

1. *I. Helenium* (Linn.): leaves (large) velvety-tomentose beneath, denticulate; the radical ones ovate, tapering into a petiole; the cauline partly clasping; heads solitary at the summit of the stout somewhat corymbose peduncles.—*Linn.! spec.* 2. *p.* 881; *Fl. Dan. t.* 728; *Lam. ill. t.* 680; *Darlingt. fl. Cest. p.* 476; *DC.! l. c.* Aster Helenium, *Scopoli.* Corvisartia Helenium, "*Merat, fl. Par.;*" *Cass. in dict. l. c.* 10. *p.* 572. Helenium seu Exula Campana, &c., *Clayt.*

Road-sides and about houses, introduced from Europe, and naturalized in many places.—The thick and branching perennial root is mucilaginous and slightly bitter, and is employed as a popular remedy.—The old officinal name is *Enula Campana*, whence *Elecampane.*

Subtribe 5. ECLIPTEÆ, *Less.*—Heads radiate, heterogamous, never diœcious. Receptacle chaffy. Anthers not caudate at the base. Pappus none, or awn-like.—Leaves opposite. (Plants with nearly the habit and structure of Heliantheæ, except the style, which corresponds with Asteroideæ.)

67. BORRICHIA. *Adans. fam.* 2. *p.* 130; *DC. prodr.* 5. *p.* 488.

Heads many-flowered; the ray-flowers ligulate, pistillate, in a single series; those of the disk perfect and tubular. Involucre hemispherical, imbricated; the exterior scales foliaceous. Receptacle flat, covered with lanceolate rigid persistent chaffy scales, as long as, or sometimes shorter than the flowers of the disk. Corolla of the ray short and broad; of the disk scarcely dilated at the throat, 5-toothed. Anthers blackish, tipped with an

ovate appendage. Branches of the style (in the disk) elongated, rather thick, somewhat terete, acutish, hispid from the summit to near the base. Achenia somewhat cuneiform, 3–4-angled, crowned with a short coroniform 4-toothed (or nearly obsolete) pappus.—Shrubby (American and mostly tropical) maritime plants. Leaves opposite and somewhat connate, oblong or linear, coriaceous or fleshy. Heads solitary, pedunculate. Flowers yellow.

1. *B. arborescens* (DC.): glabrous; leaves lanceolate, mucronately acute, narrowed at the base, entire; exterior scales of the involucre ovate, rather acute, appressed; the interior obtuse, membranaceous; chaff of the receptacle spatulate, obtuse.—Buphthalmum arborescens, *Linn. spec.* (*ed.* 2.) 2. *p.* 1273. Asteriscus, &c., *Dill. Elth. t.* 38, *f.* 43. Corona-solis frutescens, &c., *Plum. Amer. ed. Burm. t.* 16, *f.* 2. Diomedea unidentata, *Cass. in dict. l. c.* 13. *p.* 284. D. glabrata, *H. B. & K.*

Key West, *Mr. Blodgett!*—A large shrub.

2. *B. frutescens* (DC.): canescent with a minute appressed silky pubescence; leaves lanceolate or spatulate, obtuse, attenuate and usually 1–2-toothed towards the base; those of the branches often toothless, sometimes linear; exterior scales of the involucre somewhat spreading, rather acute; the interior and the chaff of the receptacle cuspidate with a rigid point.—*DC.! prodr.* 5. *p.* 489. Buphthalmum frutescens, *Linn.! spec.* (*ed.* 1) 2. *p.* 903; *Walt.! Car. p.* 212; *Michx.! fl.* 2. *p.* 130; *Pursh, fl.* 2. *p.* 563; *Ell. sk.* 2. *p.* 408. Asteriscus frutescens &c. *Dill. Elth. t.* 38, *f.* 44. Chrysanthemum fruticosum &c., *Catesb. Car.* 1. *t.* 93. Diomedea bidentata, *Cass. l. c.*

On the coast, Virginia! to Florida! and Key West! June–Oct.—A small shrubby plant. The leaves vary from obovate or broadly spatulate to linear; in all the states being either obtuse or acuminate-mucronate, entire, or with one or two sharp salient teeth near the base, or remotely denticulate throughout: the exterior scales of the involucre are often rather appressed; the inner either canescent, or nearly glabrous with ciliate margins, and the spinous points of the chaff are at first rather shorter than the flowers. Hence perhaps B. argentea, B. Peruviana, and Buphth. lineare, *Willd.* are not sufficiently distinct.

68. ECLIPTA. *Linn. mant. Gærtn. fr. t.* 169; *DC. prodr.* 5. *p.* 489.

Heads many-flowered; the ray-flowers pistillate, ligulate, short, in a single series; those of the disk tubular and perfect. Scales of the involucre 10–12, in a double series, foliaceous, ovate-lanceolate, somewhat acuminate. Receptacle flat, furnished with linear-filiform or bristly chaff, as long as the achenia. Corolla of the ray-flowers with a narrow ligule rather shorter than the involucre; of the disk inflated above, 4–(rarely 5- ?) toothed. Appendages of the style hairy. Achenia 3–4-sided; those of the disk mostly by compression 2-sided, the sides roughened or tuberculate, somewhat hairy at the summit. Pappus none, or an obsolete denticulate crown.—Chiefly annual scabrous or strigose herbs; the stems erect, diffuse, or procumbent. Leaves opposite, serrate or nearly entire, lanceolate or oblong, feather-veined, or somewhat triplinerved. Heads on axillary solitary or geminate, or terminal and ternate, peduncles. Flowers white. Anthers brownish. Juice of the stem turning black.

1. *E. erecta* (Linn.): more or less strigose throughout with closely appressed rigid hairs; stem erect, ascending, or decumbent; leaves lanceolate or oblong-lanceolate, acute or attenuate at each end, sparingly or obscurely serrate; scales of the involucre acute or acuminate; pedicels 3–6 times the length of the head.—*Linn.! mant. p.* 157, (*pl. Gronov. &c.*); *Lam. ill. t.* 687; *Pursh, fl.* 2. *p.* 561; *DC.! prodr.* 5. *p.* 490. E. procumbens, *Michx.! fl.* 2. *p.* 129; *Pursh, l. c.*; *Ell. sk.* 2. *p.* 403; *DC.! l. c.* Verbesina alba, *Linn. spec.* 2. *p.* 902. Eupatorio-phalacron &c., *Dill. Elth. t.* 113, *f.* 137. Scabiosa conyzoides &c., *Pluk. alm. t.* 109, *f.* 1. Amellus Carolinianus, *Walt. Car. p.* 313. Grangea lanceolata, *Poir.* ex *DC.*

β. brachypoda: pedicels as long as the heads, or about twice their length.—E. brachypoda, *Michx. l. c.* (but the corolla of the disk 4-cleft!), scarcely of *DC.*

Banks of streams, and in damp sandy soil, Maryland! and Kentucky! to Florida! and Louisiana! common. (Also at Mulgrave Sound on the N. W. Coast, according to De Candolle.) *β.* Maryland! Kentucky! and Louisiana! with the ordinary form. June–Oct.—Stems 1–3 feet long, often rooting at the base. Heads small; the flowers rather inconspicuous. Chaff of the receptacle fringed. In all the specimens from numerous localities which we have examined, we have, like Elliott, never found a 5-cleft corolla, and therefore suspect some mistake on the part of Walter and Michaux. The plant which in every other respect accords with the E. brachypoda, *Michx.*, only differs in its shorter pedicels, upon which we think little dependence can be placed. Our plant frequently has the peduncles 5 to 6 times the length of the head; and we have seen East Indian specimens of E. erecta with the peduncles as short as in E. brachypoda.

TRIBE IV. SENECIONIDEÆ. *Less.*

Heads heterogamous, homogamous, or heterocephalous (diœcious or monœcious). Style (in the perfect flowers) cylindraceous above; the branches linear (somewhat thickened or convex externally), penicillate or hairy at the apex, either truncate, or produced into a cone, or a more or less elongated and hispid appendage; the stigmatic lines terminating in the base of the cone or appendage, not confluent.—Leaves opposite or alternate.

CONSPECTUS OF THE SUBTRIBES.

Subtribe 1. MELAMPODINEÆ. Flowers all unisexual; the staminate and pistillate either occupying the same, or different heads, in the same or different individuals. Anthers not caudate. Pappus never of bristles. 271

Subtribe 2. HELIANTHEÆ. Heads heterogamous and radiate, or homogamous and discoid. Receptacle partly or entirely chaffy. Pappus none, or coroniform, or awned, or of few squamellæ. Anthers blackish, not caudate. Leaves often opposite. 295

Subtribe 3. FLAVERIEÆ. Heads 1–few-flowered, densely aggregated, heterogamous. Leaves opposite. 360

Subtribe 4. TAGETINEÆ. Heads heterogamous and radiate, or homogamous and discoid. Receptacle not chaffy. Pappus awned or setose. Involucre with the scales in a single series and mostly united, dotted, like the opposite leaves, with large pellucid glands. 361

Subtribe 5. HELENIEÆ. Heads mostly heterogamous. Pappus of several or numerous scarious chaffy scales, in a single series, distinct, rarely none. Leaves mostly alternate. 363

Subtribe 6. ANTHEMIDEÆ. Heads mostly heterogamous. Pappus none or coroniform, rarely squamellate. Anthers not caudate. Branches of the style truncate and bearded at the apex, rarely terminated by a short cone. Leaves mostly alternate. p. 406

Subtribe 7. GNAPHALIEÆ. Heads homogamous and discoid, or rarely heterogamous. Anthers caudate. Pappus of capillary or setaceous bristles, very rarely none. Leaves mostly alternate. 425

Subtribe 8. SENECIONEÆ. Heads homogamous or heterogamous, discoid, or radiate. Anthers not caudate. Pappus of capillary bristles, or very rarely wanting in the exterior flowers. Leaves alternate. 433

Subtribe 1. MELAMPODINEÆ, *DC.* (Polygamia Necessaria, *Linn.*)—Flowers all unisexual; the pistillate and staminate flowers either in different individuals, or in different heads of the same plant, or in the same head. Anthers not caudate at the base. Receptacle almost always chaffy. Pappus none, or somewhat coroniform, or awned, never of bristles.

CONSPECTUS OF THE GENERA.

Div. 1. MELAMPODIEÆ.—Heads monœcious, radiate. Achenia corticate.

69. MELAMPODIUM. Inner scales of the involucre investing the achenia.

Div. 2. MILLERIEÆ.—Heads monœcious, radiate. Achenia not corticate nor winged.

70. BLENNOSPERMA. Receptacle naked. Achenia pulverulent-papillose.

71. POLYMNIA. Receptacle chaffy. Achenia obovoid: pappus none.

72. CHRYSOGONUM. Receptacle chaffy. Achenia obcompressed 4-angular: pappus coroniform-toothed.

271 *Div.* 3. SILPHIEÆ.—Heads monœcious, radiate; the rays deciduous. Achenia not corticate, obcompressed, or winged. Pappus of two teeth or short awns.

73. SILPHIUM. Achenia winged, in more than one series.

74. BERLANDIERA. Achenia wingless, one adhering to each inner involucral scale.

75. ENGELMANNIA. Achenia wingless, free: pappus 2-auriculate-squamellate.

Div. 4. PARTHENIEÆ.—Heads monœcious, radiate: rays marcescent. Achenia not corticate, obcompressed.

76. PARTHENIUM. Achenia 5; their callous margins united at the base with the chaff of 2 contiguous sterile flowers.

285 *Div.* 5. IVEÆ.—Heads monœcious, not radiate. Anthers scarcely united.

77. CYCLACHÆNA. Heads glomerate-paniculate, bracteate: the central flowers abortive.

78. IVA. Heads bracteate. Receptacle chaffy. Flowers glabrous.

79. PICROTHAMNUS. Receptacle naked. Achenia and corolla woolly.

299 *Div.* 6. AMBROSIEÆ.—Heads heterocephalous; the sterile and fertile heads in the same or different plants, not radiate. Anthers distinct.

80. AMBROSIA. Fertile involucre 1-celled, 1-flowered, not spinose throughout.

81. FRANSERIA. Fertile involucre 1–4-celled, spinose; the sterile 8–12-toothed.

82. XANTHIUM. Fertile involucre 2-celled; the scales of the sterile distinct.

Div. 1. MELAMPODIEÆ, *DC.*—Fertile and sterile flowers in the same heads; the former several, ligulate; the latter central, tubular. Achenia corticate* (that is, invested and concrete with the scales of the involucre or chaff of the receptacle). Pappus none. Anthers united.

69. MELAMPODIUM. *Linn.; Gærtn. fr. t.* 169; *R. Br. in Linn. trans.* 12. *p.* 104.

Heads many-flowered; the ray-flowers 5–10, in a single series; those of the disk sterile by the abortion of the style. Involucre double; the exterior of 3–5 flat and spreading foliaceous scales; the inner as many as the ray-flowers and enclosing their achenia. Receptacle convex or subulate-conical, chaffy; the chaff membranaceous, deciduous. Style in the sterile-flowers undivided and hairy above. Achenia of the disk abortive; of the ray obovoid, smooth, slightly curved, invested by the inner scales of the involucre, which are often rugose or tuberculate, or cucullate at the summit, and either truncate or produced into 1–3 teeth or awns.—Herbaceous or suffruticose (chiefly Mexican) plants, with dichotomous stems, opposite sessile leaves, and terminal or alar peduncles bearing a single head. Flowers yellow, or the rays rarely (in two species?) white.

1. *M. ramosissimum* (DC.): stem slightly suffruticose, much branched, glabrous; leaves linear, pubescent with somewhat appressed hairs, entire, or remotely dentate-lobed or sinuate; peduncles longer than the leaves; rays oblong-linear, small (yellow); exterior scales of the involucre oval, pubescent externally; the interior involving the achenia, tuberculate at the base, the summit expanded into a broad hood, with a dorsal uncinate acumination. *DC.! prodr.* 5. *p.* 518.
Texas, *Berlandier!* (v. sp. in *herb. DC.*)

2. *M. leucanthum:* suffruticose, much branched at the base, strigose throughout and dotted with minute resinous globules; leaves very numerous, linear, the lower linear-spatulate, obtuse, entire, strigose-hispid above; peduncles much longer than the leaves; rays oval-oblong, emarginate, thrice the length of the ovate and hairy exterior scales of the involucre; the inner enclosing the achenia, tuberculate-scabrous towards the base, dilated above into a short smooth hood, truncate at the summit, with the margin entire and involute.
Texas, *Dr. Riddell!*—Plant 6–10 inches high. Leaves 1–2 inches long, somewhat canescent, above with hispid, beneath with weak hairs. Rays about half an inch long. Chaff of the receptacle laciniate-fimbriate at the summit.—Nearly allied to (and possibly not distinct from) M. cinereum, *DC.*, a Mexican species collected by Berlandier, which is also remarkable for having white rays.

Div. 2. MILLERIEÆ, *DC.*—Fertile and sterile flowers in the same heads; the former few, ligulate, or sometimes tubular and 3-cleft; the latter central, tubular. Achenia not corticate, (that is not coherent with the scales

* We have used the term as employed and defined by De Candolle in this place. But in the Heliopsideæ, and other places, this author also terms those achenia *corticate* in which the exterior covering (calyx-tube) is separable from the interior.

of the involucre or chaff of the receptacle when invested by these), or winged. Pappus none, or coroniform. Anthers united.

Baltimora recta, Linn. (Fougerouxia recta, *DC.*) is a native of the coast of Mexico, and not of Maryland, as Linnæus supposed, being misled by the synonym he adduced from Plukenet (Chrysanthemum Americanum, caule alato, amplioribus foliis binatis, &c. *Pluk. mant. p.* 46, *t.* 342, *f.* 3.), which probably belongs to Verbesina Siegesbeckia.

70. BLENNOSPERMA. *Less. syn. p.* 267; *DC. prodr.* 7. *mant. p.* 288.

Coniothele & Apalus, *DC.*

Heads many-flowered; the ray-flowers 5–10, in a single series, pistillate, the elliptical ligule obtuse at the base and articulated with the ovary, entirely destitute of tube; those of the disk numerous, tubular, sterile by the abortion of the ovary. Scales of the involucre 5–10, elliptical or oblong, membranaceo-herbaceous, nearly in a single series. Receptacle at length convex, not chaffy. Corolla of the disk short, with a much dilated 4–5-lobed limb. Anthers oval. Style in the fertile flowers with short obtuse branches; in the sterile capitate. Achenia (of the disk none,) of the ray oblong, terete, narrowed towards the base, canescent with pulverulent papillæ (which when moistened open at the extremity, or by 2 valves, and emit 2 long filaments of extreme tenuity, soon forming an apparently gelatinous mass equal in thickness to the achenia itself), destitute of pappus.—Annual slender and somewhat branching small herbs (Chilian and Californian), with alternate pinnately-parted leaves; the branches naked and somewhat pubescent above, and mostly terminated by a single small head. Rays, disk-flowers, and anthers pale yellow.

1. *B. Californicum*: scales of the involucre and rays 7–10; a series of fertile apetalous flowers alternating with the rays; branches of the style in the fertile flowers oval, flat.—Coniothele Californica, *DC.! prodr.* 5. *p.* 531; *Hook. & Arn.! bot. Beechey, suppl. p.* 352.

California, *Douglas!*—Plant 4–6 inches high, slightly pubescent when young.—Beyond the characters given above, the Californian plant scarcely differs from B. Chilense, except in the rather fewer disk-flowers of the latter, the linear-oblong branches of the fertile style, and the evidently 5-sulcate-striate achenia. In both, the elliptical ray is immediately sessile on the ovary, and when it falls off leaves a round perforation close to its base. The only distinction of any generic consequence between Blennosperma and Coniothele is entirely unnoticed by De Candolle, and may not be constant; but if it prove a permanent character, it will be proper to preserve the name of Coniothele for the section. It consists in the presence of a series of fertile flowers alternate with the rays, and exactly similar to them, except that, instead of a sessile ligule, they bear a minute deciduous ring, which represents the ligule reduced to its mere insertion. These apetalous flowers we uniformly observe in Californian specimens, but do not find in the Chilian plant.—An excellent account of the structure of the papillæ of the achenia, and the included spiral filaments, as observed in some other Compositæ, is given by Decaisne, in *Ann. sci. nat.* (*ser.* 2.) 6. *p.* 251.

71. POLYMNIA. *Linn.*; *Gærtn. fr. t.* 174, *f.* 2; *DC. prodr.* 5. *p.* 514.

Heads many-flowered; the ray-flowers (5–10 or more) pistillate, in a single series; those of the disk tubular, sterile. Scales of the involucre in a double series; the exterior about 5, large and spreading, foliaceous, ovate or lanceolate; the interior smaller, membranaceous, partly embracing the fertile achenia. Receptacle flat, chaffy; the chaff scarious, lanceolate or oblong. Corolla of the disk inflated above, thin and pellucid, with 5 short teeth. Style in the sterile flowers 2-cleft; the branches hairy. Achenia glabrous, destitute of pappus; those of the disk abortive, terete; of the ray thick, obovoid, slightly compressed laterally, wingless.—Perennial (American) herbs, usually viscid-pubescent, with an unpleasant odor. Leaves opposite, or sometimes alternate (at least the uppermost), large, dilated, membranaceous, variously angled, lobed, or cleft, often with stipule-like appendages at the base. Heads paniculate-corymbose. Flowers yellow or yellowish.

§ 1. *Rays inconspicuous, shorter than the involucre.*—Eupolymnia. (Alymnia, *Neck.* Polymniastrum, *Lam.*)

1. *P. Canadensis* (Linn.): viscid-pubescent; leaves petioled, opposite; the uppermost alternate, deltoid-ovate or rhomboidal, often 3–5-angled or lobed, or somewhat hastate; the lower deeply pinnatifid or lyrate; involucre very viscid and hairy; the exterior scales ovate-lanceolate, acuminate, rather larger than the (5–8) interior; rays obovate-cuneiform, obtusely 3-lobed at the summit; achenia crowned with a protuberant ring.—*Linn.! spec.* 2. *p.* 926, *& amæn. acad.* 3. *t.* 1, *f.* 5; *Lam. ill. t.* 711; *Michx.! fl.* 2. *p.* 147; *Pursh! fl.* 2. *p.* 579; *Ell. sk.* 2. *p.* 471; *Darlingt.! fl. Cest. p.* 476; *DC.! prodr.* 5. *p.* 515. P. variabilis, *Poir. dict.* 5. *p.* 505? Polymniastrum, *Lam. ill. t.* 712?

Hill-sides in shady rich soil along streams, Canada! and Northern States! to the mountains of Carolina! and west to Missouri. July.–Aug.—Stem 2–5 feet high. Leaves very thin, pale green. Heads small. Flowers very pale yellow or ochroleucous.

§ 2. *Rays flat, much longer than the involucre.*—Polymnactis. (Polymnia, *Lam., Cass.*)

2. *P. Uvedalia* (Linn.): scabrous-pubescent or somewhat hirsute; leaves opposite, triplinerved, broadly ovate or deltoid; the lower large, nearly as broad as long, palmately lobed and sinuate, abruptly narrowed into a winged petiole; the uppermost nearly sessile, sinuate-toothed; involucre slightly pubescent and viscid; the exterior scales oblong-ovate, obtuse, ciliate, many times larger than the (10–14) ovate-lanceolate acuminate interior ones; rays linear-oblong, 3-toothed at the apex, thrice the length of the inner scales of the involucre.—*Linn.! spec.* (*ed.* 2) 2. *p.* 1303: *Lam. ill. t.* 711, *f.* 2; *Michx.! fl.* 2. *p.* 147; *Pursh, l. c.*; *Ell. l. c.*; *Darlingt. l. c.*; *DC.! prodr.* 5. *p.* 515. Osteospermum Uvedalia, *Linn. spec.* (*ed.* 1) *p.* 923. Chrysanthemum angulosis platani-foliis, &c., *Pluk. alm. t.* 83, *f.* 3. C. perenne Virginianum, &c., *Moris. hist.* 3. *sect.* 6. *t.* 7, *f.* 55.

Rich dry soil, New York! and Pennsylvania! (rare) to Georgia! Louisiana! and Arkansas! and Missouri! June–Aug.—Stem stout, grooved and angled, nearly glabrous below, 4–10 feet high. Lower leaves about a foot

wide; the wing of the petioles sinuate or pinnatifid. Heads large; the rays an inch long, 10–15 in number, bright yellow; the corolla of the disk dull yellow. Achenia large, striate.

72. CHRYSOGONUM. *Linn.*; *Gærtn. fr. t.* 174; *DC. prodr.* 5. *p.* 510.

Heads many-flowered; the ray-flowers about 5, pistillate; those of the disk sterile. Involucre double, each of about 5 scales; the exterior foliaceous, oblong, longer than the disk; the interior chartaceous, roundish, concave, embracing the fertile flower in its axil. Receptacle flat; the linear obtuse persistent chaff subtending the sterile flowers; 2 or 3 usually adherent to the base of each inner involucral scale. Corolla of the disk cylindraceous, 5-toothed. Style in the sterile flowers hispid above, undivided, or sometimes 2-cleft at the apex. Achenia of the ray obovate, obcompressed, 4-angled, somewhat convex on the back, enclosed in a scale of the involucre; of the disk linear, abortive. Pappus small, coroniform, 2–3-toothed, and divided to the base on the inner side, persistent.—A low tomentose-hirsute perennial herb, nearly acaulescent when it begins to flower, producing several stems, some of which are erect or ascending and floriferous, others prostrate and stoloniferous. Leaves opposite, or clustered at the base, on long petioles, ovate or spatulate, crenate. Peduncles solitary, simple, naked, at first short, at length elongated. Flowers bright yellow.

C. Virginianum (Linn.)—*Lam. ill. t.* 713; *Gærtn. fr.* 2. *p.* 436, *t.* 174 (the pappus bad); *Walt.! Car. p.* 217; *Michx.! fl.* 2. *p.* 148; *Pursh! fl.* 2. *p.* 579; *Ell.! sk.* 2. *p.* 472. C. Virginianum & diotostephus, *DC.! l. c.* Diotostephus repens, *Cass. in dict. sci. nat.* 48. *p.* 453. Chrysanthemum Virginianum, &c., *Pluk. alm. t.* 83, *f.* 4, & *t.* 242, *f.* 3.

Dry fertile soil, Maryland! to Florida! and Illinois! to Louisiana! April–July.—We are confident that Cassini has founded two genera, and De Candolle two species, upon one and the same plant. We have never seen a pappus like Gærtner's figure, nor exactly as Cassini describes his Diotostephus; but it is almost always as stated by Michaux and Elliott, that is, 3-toothed; and the middle tooth is often shorter, or irregularly crenate, and probably sometimes nearly wanting, when it would accord with Cassini's character. The plant, when it commences flowering, presents only a tuft of radical leaves (with rather short petioles), and a single head on a short radical peduncle; but the succeeding leaves are borne on elongated petioles, the ascending stems at length 6–12 inches high, and the peduncles which are always short before the heads expand, often attain the length of 2 or 3 inches. When old, the leaves become rather glabrous.

Div. 3. SILPHIEÆ, *DC.*—Fertile and sterile flowers in the same heads; the former (3–20) ligulate, the rays deciduous; the latter numerous, central, tubular. Fertile achenia obcompressed, sometimes winged, not corticate, destitute of pappus, or mostly 2-toothed or 2-awned. Anthers united.

73. SILPHIUM. *Linn.*; *Gærtn. fr. t.* 171; *Schkuhr, handb. t.* 262.

Heads many-flowered; the ray-flowers numerous, pistillate, the ligules in a single series, but the flat ovaries in 2–3 rows; those of the disk tubular,

sterile. Involucre broadly campanulate; the scales appressed at the base, more or less spreading or loose and foliaceous at the summit, imbricated in several series; the innermost (those next the achenia) very small and chaffy. Receptacle small, flat, or somewhat turbinate when old; the chaff linear, flat, or slightly involute around the sterile ovaries. Corolla of the ray with an elongated spreading ligule; of the disk cylindrical; the teeth very short, somewhat thickened and glandular, often pubescent or hairy externally. Style in the sterile flowers undivided, much elongated, hispid. Achenia of the ray broad and flat, obcompressed, imbricated in 3–4 series, surrounded with a wing, which is notched at the summit, and usually confluent with 2 callous, subulate, or somewhat awn-like (often nearly obsolete) teeth, which represent the pappus; those of the disk abortive, slender, with an obsolete coroniform pappus.—Stout perennial herbs (natives of the United States and Texas), mostly hispid or scabrous, with a copious resinous juice. Leaves alternate, opposite, or verticillate, entire, serrate, or lobed. Heads (large) corymbose, panicled, or solitary. Flowers yellow.

* *Stem terete, virgate or nearly naked: leaves large, alternate, or radical and on long petioles, often sinuate, lobed, or pinnately parted.*

1. *S. laciniatum* (Linn.): hispid with white spreading hairs; leaves pinnately parted, mostly petioled, but dilated and clasping at the base; the segments lanceolate or linear, sinuate-toothed, incised, or pinnatifid, or sometimes entire, acute; heads (very large) few, racemose-spicate; scales of the involucre ovate, hispid and ciliate, produced into a long rigid and usually squarrose acuminate appendage; achenia orbicular-obovate, with a manifest and scarious wing, deeply emarginate.—*Linn.! spec.* 2. *p.* 919; *Linn. f. dec. p.* 5, *t.* 3; *Ait.! Kew.* (*ed.* 1) 3. *p.* 267; *Michx.! fl.* 2. *p.* 145; *Pursh? fl.* 2. *p.* 577; *Jacq. f. eclog.* 1. *t.* 90; *DC.! prodr.* 5. *p.* 512; *Hook. compan. to bot. mag.* 1. *p.* 99. (excl. syn. E. pinnatif.) S. spicatum, *Poir. dict.* 5. *p.* 157. S. gummiferum, *Ell. sk.* 2. *p.* 460.

β. cauline leaves numerous towards the lower part of the stem, sessile and clasping, ovate-lanceolate, laciniate-pinnatifid.

Prairies from Iowa! Wisconsin! Missouri! Illinois! and Ohio! to Kentucky! Alabama! Louisiana! Arkansas! and Texas! *β*. Prairies of Alabama, *Mr. Buckley!* July–Sept.—Root thick. Plant exuding a copious resin, 3–11 feet high. Stem simple, striate-grooved and nearly glabrous at the base, somewhat naked above, clothed, as also the young heads, veins of the leaves &c., with large very white jointed hairs arising from rigid papillæ. Lower leaves 12–30 inches long, often bipinnatifid, with an ovate circumscription, sometimes lanceolate and simply pinnately parted, with the segments narrow and rather remote, either entire or toothed. Heads frequently 2 inches in diameter, without including the rays, which usually exceed the involucre: the terminal one flowers earliest, and 2 or 4 others appear later in the axils of often remote bracts, or of the upper leaves, either sessile or peduncled. The var. *β*., which came from the same region as Elliott's S. gummiferum, does not however so well accord with his description as the ordinary S. laciniatum, which varies greatly in foliage. In this variety the incisions of the cauline leaves do not reach more than half-way to the midrib.—*Rosin-weed.*

2. *S. terebinthinaceum* (Linn.): stem and peduncles glabrous; leaves ovate and ovate-oblong, mostly cordate at the base, sharply serrate-toothed,

hispid-scabrous, especially beneath; the radical ones very large and on long petioles; the cauline very few, oblong; heads (rather large) in a loose irregular panicle; scales of the involucre glabrous, the exterior orbicular, the others obovate or oval, obtuse; rays numerous; achenia obovate, very narrowly winged, emarginate-2-toothed.—*Linn. suppl. p.* 383; *Jacq. hort. Vindob.* 1. *t.* 43; *Gærtn. fr. t.* 171; *Ait.! Kew.* (*ed.* 1) 3. *p.* 267; *Michx.! fl.* 2. *p.* 145; *Schkuhr, handb. t.* 262; *Pursh, l. c.*; *DC.! l. c.*; *Hook. bot. mag. t.* 3525; not of *Ell.*

Prairies and dry open woods, Michigan! and throughout the Western States! to Louisiana! and the western part of Georgia! July–Sept.—Stem 4–9 feet high, leafless except near the base, exuding a copious resinous juice. Radical leaves often more than 2 feet long, resembling those of the *Burr-dock*, but more rigid (the plant is sometimes called *Prairie Burr-dock*); the short hispid hairs arising from a broad papillose base, in which a resinous matter is frequently deposited, and the cuticle desquamates, so that the leaf appears thickly sprinkled with white scurfy dots, particularly the lower surface. Heads about an inch in diameter, excluding the rays, which are an inch or more long. The narrow wings of the achenia either entirely confluent with the teeth of the achenia, which then appears rather deeply emarginate; or the wings are somewhat contracted at the summit, which is then more obtusely toothed, and less deeply emarginate.

3. *S. pinnatifidum* (Ell.): glabrous, except the petioles and lower surface of the leaves, which are more or less hirsute and scabrous; leaves large, oblong, varying from pinnately incised to deeply pinnatifid; the radical on long petioles, slightly cordate, the cauline few and cuneiform at the base; exterior scales of the involucre orbicular, the inner broadly oval; rays numerous; achenia oval-obovate, very narrowly winged, obtusely emarginate and slightly 2-toothed.—*Ell.! sk.* 2. *p.* 462; *DC. prodr.* 5. *p.* 512.

Prairies, western part of Georgia and Alabama, *Elliott! Mr. Buckley!* Ohio, *Dr. Riddell! Mr. Sullivant!* Aug.–Sept.—Plant with the habit of the preceding, and with equally large leaves and heads, rays an inch and a half long. Achenia with 2 very short and rounded callous teeth.—As this plant bears in its foliage the same relation to the true S. terebinthinaceum that S. compositum of Michaux does to the S. terebinthinaceum of Elliott, and presents no other sufficiently marked characters, it may not improbably prove to be a variety of the preceding.

4. *S. compositum* (Michx.): glabrous; stem virgate, nearly naked, glaucous; radical leaves broadly ovate, cordate, or reniform-cordate, on long petioles, angulate-toothed, sinuate-toothed, or deeply and irregularly pinnatifid, often ternately divided, the petiolulate divisions sinuate-pinnatifid or toothed, glabrous above, sparsely pubescent beneath when young, the margins minutely ciliate and scabrous; heads (small) numerous, in a spreading cymose-corymbose panicle; scales of the involucre glabrous, obtuse, the exterior oval, the others obovate or spatulate; rays 9–12; achenia obovate-orbicular, rather broadly winged, deeply and narrowly emarginated; the wing confluent with the acute or subulate teeth.

α. Michauxii: leaves deeply sinuate-pinnatifid, or sometimes ternately divided, the divisions (3–9) sinuate-lobed or toothed.—S. compositum, *Michx.! fl.* 2. *p.* 145; *Willd. spec.* 3. *p.* 2331; *Pursh, fl.* 2. *p.* 577; *Ell. sk.* 2. *p.* 462; *DC.! prodr.* 5. *p.* 512. S. laciniatum, *Walt. Car. p.* 217, not of *Linn.* S. sinuatum, *Herb. Banks.!* S. nudicaule, *Curtis! cat. Wilmingt. pl. in Bost. jour. nat. hist.* (1835) 1. *p.* 127. S. terebinthaceum β. sinuatum, *Curtis! mss.*

β. reniforme: leaves (larger) roundish or reniform-cordate, sinuate-toothed or angulate, or slightly lobed.—S. elatum, *Pursh, l. c.* (ex. descr.) S. terebinthinaceum, *Ell. sk.* 2. *p.* 463, not of *Linn.* S. reniforme, *Raf. med. fl.* 2. *p.* 283; *Nutt.! in trans. Amer. phil. soc. l. c. p.* 342.

γ. *ovatifolium*: leaves ovate, subcordate, unequally and doubly toothed.

Dry pine barrens and open sandy woods, North Carolina! to Florida! the var. *α.* prevalent in the low country; *β.* more common towards the mountains. *γ.* Florida, *Mr. Croom! Dr. Chapman!* June–Aug.—Stem 2–6 feet high, slender, simple, paniculate or corymbose at the summit, with a few scattered bracts, or sometimes 3 or 4 small petiolate leaves towards the base. Leaves 4–8 inches long (in *β.* usually broader than long); the scattered hairs of the lower surface not arising from papillæ, as in S. terebinthinaceum. Heads much more numerous, more corymbose or rather cymose, and smaller than in the last named species. Scales of the involucre rather loose, slightly ciliate. Chaff of the receptacle with slightly dilated and hairy tips. Wing of the large orbicular achenia united with, or when old partly separating from, the subulate or aristate teeth.—This species, well-marked in habit and character, although polymorphous in foliage, is confined to the Southern Atlantic States; while S. terebinthinaceum, for which Elliott mistook the entire-leaved form, is almost exclusively a western plant. From long observation, Mr. Curtis is convinced that our *α.* and *β.* are only varieties of the same species, widely as their extreme forms differ in foliage; and our own observations confirm this view.

* * *Stem terete or obscurely angled, leafy: leaves undivided, alternate, opposite, or 3–4-nately verticillate, not unfrequently presenting all these variations in the same plant.*

5. *S. trifoliatum* (Linn.): stem smooth and glabrous, often glaucous; cauline leaves lanceolate, usually narrow, acute or acuminate, remotely denticulate, scabrous, especially the upper surface, on very short hispidly ciliate petioles, ternately or quaternately verticillate, the uppermost opposite; heads in a loose compound corymb or panicle; scales of the involucre ciliate, glabrous; the exterior ovate, rather acute; the interior broadly oval, obtuse; achenia obovate-oval; the rather broad wings produced at the summit into 2 acute triangular lobes, which are confluent with (when old often more or less separating from) the subulate teeth or awns.—*Linn. spec.* 2. *p.* 920 (excl. syn. *Moris.*); *Desf. cat.*; *Hook. bot. mag. t.* 3355. S. trifoliatum, ternatum, & atropurpureum, *Retz, in Willd. spec.* 3. *p.* 2333; *Pursh, l. c.*; *Ell. sk.* 2. *p.* 466. S. ternatum & S. trifoliatum (at least in part) *DC.! l. c.* S. ternifolium, *Michx.! fl.* 2. *p.* 146, chiefly. Chrysanthemum Virginianum, foliis asperis, &c., *Moris. hist. t.* 3, *f.* 68.—Varies with the leaves nearly all verticillate, or the upper opposite and alternate, entire, or irregularly serrate, lanceolate or ovate-lanceolate, scabrous or nearly smooth on both sides; the short petioles ciliate or glabrous; the stem sometimes pale, but commonly purple and glaucous.

Dry woods and plains, Ohio! Maryland! and throughout the mountainous portion of the Southern States! July–Oct.—Stem 4–6 feet high, striate, slightly angled. Leaves 4–6 inches long, frequently less than an inch broad. Heads rather small; the rays 12–18. The subulate awns of the achenia equalling or slightly exceeding the wings, with the edges of which they are confluent, but when mature they often break away.

6. *S. dentatum* (Ell.): stem usually smooth and glabrous, or hirsute-scabrous towards the summit; leaves lanceolate or ovate-lanceolate, acute, irregularly and coarsely toothed, scabrous above but scarcely so beneath; the upper alternate or scattered, somewhat petioled or sessile; the lower opposite or ternately verticillate, on rather slender hirsute-ciliate petioles; heads corymbose; scales of the involucre broadly ovate, obtuse, ciliate, glabrous; achenia broadly obovate, narrowly winged, obtusely emarginate at the summit, or almost truncate, the teeth obsolete.—*Ell.! sk.* 2. *p.* 468. S. trifoliatum, partly, *DC. l. c.?* S. affine, *M. A. Curtis! mss.*

β. lower leaves opposite; the upper alternate but approximate in pairs, on short petioles; all ovate-lanceolate and entire.

γ. stem somewhat hirsute or hispid; lower leaves opposite or alternate, petioled, coarsely sinuate-toothed or incised.—S. quercifolium, *DC.! prodr.* 5. *p.* 513. S. lanceolatum, *Nutt. in trans. Amer. phil. soc. l. c.*

Dry woods and fields, western part of N. Carolina, *Mr. Curtis!* to Georgia, *Elliott! Dr. Boykin!* and Alabama, *Mr. Buckley!* June–Sept.—Stem 2–5 feet high. Leaves 3–5 inches long, 1–1½ wide; the lower on petioles 1–3 inches long. Heads smaller than in S. Asteriscus. Rays 8–15. Achenia with narrow wings, which are very slightly produced at the apex, which is therefore broadly and slightly emarginate, minutely ciliate, sometimes with 2 minute callous rudiments of the awns or teeth.—This plant bears so much resemblance to the smoother forms of S. Asteriscus, varying also like that species with either glabrous or hispid stems, and with the leaves slightly, or very coarsely and sinuate-incisely toothed, that we can only distinguish them with certainty by the achenia; and hence we should have hesitated to consider it a distinct species, had not different states of it been so regarded by Elliott, De Candolle, Mr. Curtis, &c., apparently without reference to the achenia. We expect that this character will yet prove inconstant, and that all the varieties will be included under S. Asteriscus.

7. *S. Asteriscus* (Linn.): stem terete, hispid; leaves oblong or oval-lanceolate, irregularly and often coarsely serrate with scattered teeth, scabrous-hirsute both sides; the upper alternate and sessile; the lower mostly opposite, often ternately verticillate; the lowest on short hirsute petioles; heads solitary or somewhat corymbose; scales of the spreading involucre foliaceous, ciliate, the exterior hispid-scabrous, ovate, acutish, the inner large and obtuse; achenia obovate-oval; the rather broad wings projecting beyond the summit into 2 triangular acute lobes, united with the short subulate spreading teeth.—*Linn.! spec.* 2. *p.* 920; *Lam. ill. t.* 707; *Michx.! fl.* 2. *p.* 146; *Pursh, l. c.*; *Ell. sk.* 2. *p.* 469; *DC.! prodr.* 5. *p.* 513. Asteriscus Coronæ-Solis, &c., *Dill. Elth. t.* 37, *f.* 42.

β. *lævicaule* (DC.! l. c.): stem and sometimes the peduncles smooth and glabrous or nearly so; lower leaves elongated, often coarsely toothed or sinuate-incised, tapering into petioles.—S. scabrum, *Walt. Car. p.* 217. S. Asteriscus β. scabrum, *Nutt. gen.* 2. *p.* 183?

Dry sandy soil, Virginia! to Florida! and Louisiana! common. June–Aug.—Stem 2–4 feet high. Leaves very scabrous above, less so beneath, varying from broadly lanceolate-oblong to rather narrowly lanceolate, from nearly entire to very coarsely toothed. Heads large, with 12–15 elongated rays. Achenia moderately winged; the subulate teeth often breaking away more or less from the wing, sometimes projecting beyond it, but usually shorter.

8. *S. lævigatum* (Pursh? Ell.): smooth and glabrous; stem terete, slightly angled above; leaves coriaceous, opposite, lanceolate-oblong, acute or acuminate at both ends, remotely serrate-toothed, minutely hispid-ciliate; the lower tapering into margined petioles; the uppermost nearly sessile and obtuse or even slightly cordate at the base, often entire; heads (small) in a loose corymb; scales of the involucre ovate, ciliate, obtuse, squarrose; achenia oval-obovate, narrowly winged, emarginate and slightly toothed at the summit.—S. lævigatum, *Ell. sk.* 2. *p.* 465, not of *Pursh*, ex char., but probably the plant collected by Enslin.

Prairies &c. of the western part of Georgia (*Elliott*, &c.) and Alabama, *Mr. Buckley!* July–Sept.—Stem 2–3 feet high, stout. Leaves very smooth, except the margins; the lower 6–8 inches long and 2 in width; the uppermost much smaller. Resembles S. scaberrimum, except that it is smooth, with smaller heads; and the achenia not more than half the size,

broadly emarginate, and with very narrow wings.—Pursh's character of S. lævigatum is most applicable to a common variety of S. integrifolium: yet the latter surely is not found in the low or middle country of Georgia (although there is some reason to suppose it a native of the western Alleghanies): but the plant may have been described from the mere summit of the stem of this species; for which, as it is certainly Elliott's plant, we have retained the name.

9. *S. scaberrimum* (Ell.): stem somewhat angled, hispid, nearly glabrous when old (sometimes smooth when young); leaves opposite, oval, acute or somewhat acuminate, rigid, hispid-scabrous on both sides; the uppermost nearly sessile and entire, the lower narrowed into petioles, denticulate or serrate; heads few; scales of the involucre strongly ciliate, squarrose-spreading, the exterior acutish; achenia (large) nearly orbicular, very broadly winged, narrowly cleft at the summit.—*Ell.! sk.* 2. *p.* 446.

β. very hispid, at least when young; leaves occasionally alternate; the uppermost sessile, the lower petioled; heads often solitary.

γ. hispid and scabrous; leaves oblong and lanceolate-ovate, opposite and alternate, nearly all sessile; heads somewhat panicled.—S. asperrimum, *Hook. compan. to bot. mag.* 1. *p.* 99. S. Radula, *Nutt.! in trans. Amer. phil. soc. l. c. p.* 341.

Western districts of Georgia, *Elliott!* and Alabama, *Mr. Buckley!* *β.* & *γ.* Louisiana, (*Drummond,*) *Dr. Hale!* Arkansas, *Nuttall!* Texas, *Drummond!* Aug.–Sept.—Stem stout, 3–4 feet high. Leaves very rough; the hairs, particularly of the upper surface, arising from broad papillæ. Heads as large or larger than those of S. Asteriscus; the rays numerous. Mature achenia half an inch long, the wing also proportionally broad, often with a distinct callous tooth.—A distinct species, remarkable for its very rough leaves and large rounded achenia, although variable in its foliage, and allied to S. integrifolium.

10. *S. integrifolium* (Michx.): stem quadrangular and striate, scabrous; leaves rigid, numerous, opposite, lanceolate-ovate, with a subcordate sessile and partly clasping base, tapering to an acute point, entire, or sparingly denticulate, the upper surface and margins very scabrous, the lower closely scabrous-pubescent or often smooth; heads in a close 2–3-chotomous corymb; the lateral peduncles short; scales of the involucre rigid, scabrous, somewhat squarrose; the exterior ovate or ovate-lanceolate, acute; achenia (large) roundish oval or obovate, broadly winged, deeply emarginate and 2-toothed.—*Michx.! fl.* 2. *p.* 146; *Willd. spec.* 3. *p.* 2333; *Pursh! fl.* 2. *p.* 578; scarcely of *Elliott?*

β. lævе: stem (striate-angled), lower surface of the leaves, and sometimes even the peduncles and involucre smooth.—S. lævigatum, *Pursh, l. c.?* S. speciosum, *Nutt.! in trans. Amer. phil. soc. l. c.*

Plains, &c. Wisconsin (*Mr. Lapham!*) Illinois! Missouri! and Arkansas! to the Western districts of Georgia. *β.* With var. *α.*; and Plains of Arkansas, *Nuttall!* Aug.–Sept.—Plant rigid, 2–4 feet high, simple or corymbosely branched and dichotomous. Leaves 3–4 inches long, sometimes a little narrowed below, but usually broadest at or near the closely sessile base, and tapering regularly to the apex. Heads as large as in S. Asteriscus; the rays 15–20. Achenia 4–5 lines long.—The plant varies greatly as to roughness in the same locality, and also when cultivated, the stem being sometimes strongly scabrous, but not unfrequently perfectly smooth: the leaves are usually very scabrous above and closely scabrous-pubescent beneath; but occasionally the lower surface is rough like the upper, and often entirely smooth. The species is well marked in habit.

* * * *Stem square, at least below: leaves all opposite, connate, either directly or by winged petioles.*

11. S. *perfoliatum* (Linn.): stem stout, square, the branches often nearly terete; leaves large, ovate or ovate-oblong, thin; the lower ovate-deltoid, coarsely toothed, on winged connate petioles; the upper often nearly entire, connate-perfoliate and forming a concave disk; heads trichotomous-corymbose, the central on a long peduncle; scales of the involucre ovate, obtuse, squarrose-spreading; achenia broadly obovate, winged, emarginate.—*Linn.! spec.* (*ed.* 2) 2. *p.* 1301; *Govan, hort. Monsp. p.* 462; *Hook. bot. mag. t.* 3354. S. tetragonum & S. scabrum, *Mœnch.* S. connatum, *Michx.! fl.* 2. *p.* 146.—Varies with the stem, branches, involucre, &c. smooth and glabrous, the leaves somewhat scabrous (S. perfoliatum of authors); sometimes very scabrous above, and minutely and softly pubescent beneath; or with the stem hirsute or hispid, at least above, with deflexed hairs, and the leaves often hairy (S. connatum, *Linn. mant. p.* 574; *Willd. spec.* 3. *p.* 2332; *Pursh, fl.* 2. *p.* 578; *DC.! prodr.* 5. *p.* 514): a state with the exterior scales of the involucre larger and more foliaceous is S. conjunctum, *Willd. enum. p.* 933. As to the achenia, these are frequently obcordate-emarginate, the extremities of the wings being rounded and not at all produced (S. perfoliatum, *DC.! l. c.*); or these are produced into 2 short acute or triangular teeth (S. Hornemanni, *DC.! l. c.*, which, as to pubescence &c. is intermediate between S. perfoliatum & S. connatum of authors), or into sharp lobes producing a deep narrow notch, as is represented in *Schkuhr, handb. t.* 262. But all these forms are so variable as scarcely to admit of being distinguished as varieties, much less as species.

Banks of streams, &c. Michigan! Illinois! and Ohio! to Kentucky! Tennessee! and the mountainous portion of the Southern States! July–Sept.—Stem 4–6 feet high. Leaves 6–12 inches long, 4–8 broad; the radical somewhat cordate, on margined petioles; the upper connate either by a very broad or somewhat narrowed base; those of the branches sometimes disjoined. Heads large; the rays 15–30.—*Cup-Plant.*

S. *erythrocaulon* (Bernh. *in Sprng. syst.* 3. *p.* 630): "stem 4-angled, glabrous; leaves opposite, cordate-lanceolate, acute, unequally toothed, very scabrous; the winged petioles perfoliate; scales of the involucre oblong, rather acute," also seems to be a variety of S. perfoliatum.

74. BERLANDIERA. *DC. prodr.* 5. *p.* 517; *De Less. ic. sel.* 4. *t.* 26.

Species of Silphium, *DC. & authors.*

Heads many-flowered; the ray-flowers pistillate, ligulate, equal in number to the inner series of involucral scales (5–8, rarely 12), and situated in their axils; those of the disk tubular, sterile, partly enclosed by the somewhat foliaceous and cucullate upwardly dilated and obtuse chaffy scales of the receptacle, two of which are adherent to the base of each inner scale of the involucre and persistent, the others borne on the margin and depressed summit of the small somewhat turbinate receptacle; the central flowers occasionally somewhat abortive? and with narrower chaff. Scales of the spreading involucre foliaceous, in 3 series; the exterior 3–4, oblong or oval, smallest; the second 4 or 5, mostly obovate; the innermost (usually 5–8) largest, dilated-obovate or rhomboidal, membranaceo-chartaceous, reticulated.

Corolla of the ray with an oblong subsessile spreading ligule; of the disk cylindraceous, 5-toothed; the teeth hairy externally. Style in the sterile flowers undivided, elongated and hispid above. Achenia of the ray in a single series, flat, obcompressed, obovate, wingless, not toothed or notched at the summit, one-nerved on the outer, one-ridged and canescently pubescent on the inner surface, each more or less strongly coherent with the flat involucral scale to which it corresponds and falling away with it, partly covered by the chaff of the two attached sterile flowers; the pappus of 2 minute and caducous setose teeth or short awns: the abortive achenia of the disk linear or filiform, with an obscure coroniform pappus.—Perennial canescent or velvety-tomentose herbs or suffrutescent plants (natives of the Southern United States, Texas, and Northern Mexico), not resiniferous; with mostly solitary (middle-sized) pedunculate heads terminating the terete stem or paniculate-corymbose branches; the involucre and summit of the chaff usually canescently pubescent. Leaves alternate, cordate, ovate or oblong, and crenate, sinuate, or pinnatifid, thin, veiny. Rays yellow, pubescent externally. Corolla of the disk and anthers sprinkled with reddish resinous globules.

This genus, although well-marked in habit, is mainly distinguished from Silphium by its single series of wingless achenia, adherent to the large interior involucral scales; and, including as it does all the tomentose and canescent species of Silphium, it leaves that genus better defined in habit and character. It is singular that De Candolle, who founded the genus upon a Texan plant, and mentions its affinity on the one hand to Melampodium, and on the other to Polymnia, should not have remarked its closer alliance with Chrysogonum and especially with Silphium (from which the receptacle scarcely differs), nor have noticed the adhesion of the achenia to the scales; a character first pointed out by Mr. Bentham, in his B. lyrata of Mexico, but which occurs in all the species. As we find a corolla, stamens, &c. in all the disk-flowers, we suspect that De Candolle may have mistaken for abortive flowers some of the central abortive ovaries, from which the corolla falls at an early period. —Since our account of this genus was prepared, Mr. Nuttall, who had established a new genus upon these plants, adopted at our suggestion the name of Berlandiera, but with the appended sectional appellation of Silphiastrum. His B. longifolia, however, is doubtless the original B. Texana.

1. *B. Texana* (DC.! l. c.): herbaceous (suffrutescent *DC.*); branches and peduncles hirsute with jointed often purplish hairs; leaves oblong-ovate, cordate, simply or doubly crenate, minutely hispid-scabrous above, canescently pubescent or hairy beneath; the lowermost petioled; the others closely sessile; heads somewhat corymbose.—B. longifolia, *Nutt.! in trans. Amer. phil. soc. l. c. p.* 342.

β. betonicæfolia: leaves all petioled, cordate-ovate, deeply and coarsely crenate; peduncles clothed with jointed purplish hairs.—Silphium betonicifolium, *Hook.! compan. to bot. mag.* 1. *p.* 99.

In woods, Texas, *Berlandier!* Western Louisiana. *Dr. Hale!* Western Arkansas, *Nuttall!* β. New Orleans! *Drummond.*—Most of the specimens from Dr. Hale (which do not appear suffruticose) have the peduncles and upper part of the stem clothed with purplish hairs (colored by the deposition of a resinous matter), just as Hooker describes his Silphium betonicifolium; but the upper leaves are all sessile, as in De Candolle's plant, inclining to lanceolate-ovate, an inch or an inch and a half in length; the uppermost often acute: but those at the base of the stem are about 4 inches long, obtuse, in form very like those of a Betonica, doubly and incisely crenate, on petioles about an inch long.

2. *B. tomentosa:* herbaceous, stem softly canescent with closely appressed woolly tomentum, simple or branched; leaves ovate or oblong-ovate, green and minutely pubescent above, white and finely tomentose beneath, crenate; the uppermost cordate and sessile; the lower ones petioled; heads in small corymbs, on slender peduncles.—Silphium tomentosum & pumilum, *Pursh, fl.* 2. *p.* 579. S. reticulatum, *Pursh, l. c.?* Polymnia Caroliniana, *Poir. dict.* 5. 7. 505.

α. stem erect or ascending, simple or sparingly branched; heads few on elongated naked pedicels; leaves mostly obtuse; the lower oblong, often acute and somewhat irregularly toothed at the base.—Silphium pumilum, *Michx.! fl.* 2. *p.* 146 (a dwarf state); *Ell.! sk.* 2. *p.* 469; *DC.! prodr.* 5. *p.* 512. Berlandiera tomentosa, *Nutt.! l. c.*

β. (*dealbata*) stem mostly branched, and, with the lower surface of the more numerous cordate-ovate often acutish leaves clothed with a very white fine tomentum; heads more numerous, corymbose, on shorter peduncles.—B. pumila, *Nutt.! l. c.*

γ. stem taller, branched, at length scarcely tomentose; upper surface of the leaves scabrous.

Dry pine barrens and plains; *α* Georgia! to Florida! *β.* Arkansas, *Nuttall!* Texas, *Drummond!* *γ.* Western Louisiana, *Dr. Leavenworth!* May–Aug.—Stem varying from scarcely a foot to 3 feet high. Leaves 1½–2, the lowest often 3–4 inches long, and 1 to 2 wide. Pedicels and involucre tomentose.—When old, the soft tomentum is more or less deciduous, and the stem often branched. The var. *γ.* is in this state, and approaches the preceding. The var. *β.* appears to be an exclusively Western plant, and is larger, more leafy, &c. If it prove a distinct species, it will require a new name, since both S. pumilum and S. tomentosum were founded on the species from the Atlantic States. We have adopted the latter of these specific names, because the plant, although small for a Silphium, is one of the largest of the genus to which we have removed it.

3. *B. incisa:* herbaceous, minutely velvety-canescent throughout; stem (short?) branching; leaves lanceolate-oblong, mostly petioled, coarsely and very irregularly incised and toothed, deeply sinuate and pinnatifid towards the base; the lobes and teeth short, obtuse; heads usually solitary terminating the branches, on elongated peduncles. Silphium Nuttallianum, *Torr.! in ann. lyc. New York*, 2. *p.* 216, as to the plant collected by Dr. James; but not the Florida plant of Nuttall.

On the Arkansas or Platte, *Dr. James!*—The specimen is only the upper portion of a stem, or perhaps a branch, clothed throughout with a very fine and close whitish velvety tomentum; but the upper surface of the leaves (2 inches or more in length) less canescent. Except that the stem is leafy, it considerably resembles B. lyrata, *Benth.! pl. Hartw.*, which is, however, quite distinct from this or the following species.

4. *B. subacaulis* (Nutt.): minutely strigose-canescent, at first acaulescent; leaves (radical) deeply sinuate-pinnatifid, often lyrate, somewhat petioled; the lobes toothed or crenate; peduncles (scapes) elongated, naked, bearing a single head.—B. subacaule, *Nutt.! l. c.* Silphium subacaule, *Nutt.! in Sill. jour.* 5. *p.* 301; *DC.! prodr.* 5. *p.* 512. S. Nuttallianum, *Torr.! l. c.* as to the syn.

β. stems short, at length branching, leafy below; radical leaves oblong; the cauline oblong-spatulate, somewhat petioled; all obtuse, lyrate, or sparingly sinuate, or nearly undivided; peduncles terminal, very long.

East Florida, *Mr. Ware!* (*Nuttall*), *Dr. Burrows! Dr. Leavenworth!* Georgia, *Le Conte!* *β.* Florida, *Dr. Leavenworth!* May–Aug.?—Radical leaves about 3 inches long, clustered, rather rough, particularly the upper surface, mostly alternately sinuate-pinnatifid, often with an oblong undi-

vided terminal lobe. Scapes, or peduncles, slender, 6–8 inches long. Head as large as in B. tomentosa.

75. ENGELMANNIA. *Torr. & Gray, mss., in Nutt. trans. Amer. phil. soc. (n. ser.) 7. p. 343.*

Heads many-flowered; the ray-flowers equal in number to the inner scales of the involucre (8–10), and situated in their axils, ligulate, pistillate; those of the disk tubular, sterile. Scales of the involucre imbricated in about 3 series, coriaceo-chartaceous, broadly oval or obovate, appressed, the exterior shortest; all abruptly narrowed into a foliaceous lanceolate or linear spreading appendage, the exterior exceeding the scale itself in length. Receptacle flat; the chaff persistent, chartaceous, with foliaceous and hairy tips, partly involute and enclosing the sterile flowers; the outer series lanceolate, acute, two firmly adherent to the base of each inner involucral scale; the others very narrowly linear, rather obtuse. Corolla of the ray with an oblong exserted sessile ligule; of the disk dilated upwards, 5-toothed, the teeth somewhat hairy. Style in the sterile flowers undivided, hispid. Achenia of the ray equal in size to the concave inner involucral scales to which they are applied, oval-obovate, obcompressed, convex and carinate externally, flat or concave and one-ridged on the inside, scabrous-pubescent, not winged or toothed, crowned with two small scarious lanceolate concave marcescent squamellæ, which are more or less united at the base, hispid and fringed; those of the disk filiform, abortive, with a minute coroniform pappus.—A perennial branching rough and hirsute herb, with branching stems, corymbose-paniculate at the summit, and bearing several rather small heads on slender peduncles. Leaves alternate, strigose, oblong or ovate-lanceolate, irregularly pinnatifid, with the segments lanceolate or linear (the lower longest and divaricate), sessile; the radical petioled and bipinnatifid. Rays yellow, tardily deciduous, pubescent externally.

E. pinnatifida (Torr. & Gray, l. c.)—Silphium, n. sp. (*Nutt.*) *Torr. in ann. lyc. New York, 2. p. 215.*

On the Canadian, *Dr. James!* Red River, Arkansas, *Nuttall! Dr. Leavenworth!* Texas, *Drummond!*—Plant 1–3 feet high. Leaves 2–5 inches long. Heads about as large as in Polymnia Canadensis: the involucre subglobose. The base of the achenia coheres with the base of the involucral and the two adjacent chaffy scales, but at length it separates without tearing away the margin: the exterior coat (calyx-tube) is separable.—This genus, intermediate between Silphium and Parthenium, is dedicated to our esteemed correspondent, Dr. George Engelmann, of St. Louis, Missouri, who has for several years assiduously studied the plants of Missouri, Arkansas, &c., and made valuable contributions to many European collections, as well as to this work.

Div. 4. PARTHENIEÆ, *DC.*—Fertile and sterile flowers in the same heads; the former (several) ligulate, the rays persistent or marcescent; the latter central, tubular. Fertile achenia obcompressed, not corticate or winged, usually with a callous margin. Pappus none, or 2-squamellate. Anthers scarcely united.

76. PARTHENIUM. *Linn.*; *Gærtn. fr. t.* 168; *DC. prodr.* 5. *p.* 531.

Heads many-flowered; the ray-flowers 5, pistillate, fertile, somewhat obscurely ligulate, one in the axil of each inner scale of the involucre; those of the disk tubular, sterile by the abortion of the style. Involucre hemispherical, in a double series; the exterior ovate; the interior nearly orbicular. Receptacle conical or somewhat cylindrical, covered with membranaceous chaffy scales, which are dilated above and somewhat cucullate, partly sheathing the flowers of the disk, tomentose at the summit. Corolla of the ray very short, obcordate, persistent or marcescent; of the disk tubular, somewhat dilated above. Stamens inserted towards the base of the corolla: anthers slightly united. Style of the sterile flowers undivided: the branches of the fertile style semiterete, obtuse. Achenia (of the ray) compressed, oval or obovate, smooth, surrounded by a filiform callous margin, which is firmly coherent at the base with the involucral scale and with a contiguous chaffy scale of the receptacle on each side, at length tearing away from the achenium. Pappus 2-squamellate, or somewhat aristate, sometimes nearly obsolete.—Herbs or suffrutescent (American) plants, somewhat various in habit, canescent or hirsute-scabrous, with alternate undivided or 1–2-pinnately cleft leaves. Heads corymbose-cymose or panicled, rarely solitary. Flowers whitish.

§ 1. *Pappus of 2 very small and slender or awn-like squamellæ, sometimes obsolete: perennial or suffrutescent: leaves toothed or somewhat incised, undivided.*—PARTHENIASTRUM, Dill., DC.

1. *P. integrifolium* (Linn.): stem herbaceous, hirsute-pubescent; leaves hispid-scabrous, ovate-oblong or lanceolate-oblong, doubly crenate or crenate-toothed, or sometimes incised; the upper ones sessile or partly clasping; the lower petioled, often deeply incised at the base; heads numerous, tomentose, corymbed; exterior scales of the involucre somewhat acute.—*Linn.! spec.* 2. *p.* 988; *Lam. ill. t.* 766; *Michx.! fl.* 2. *p.* 147; *Willd. hort. Berol. t.* 4; *Schkuhr, handb. t.* 293; *Nutt. gen.* 2. *p.* 183; *Ell.! sk.* 2. *p.* 474; *DC. l. c.* Partheniastrum Helenii folio, *Dill. Elth. t.* 225, *f.* 292. Ptarmica Virginiana &c., *Pluk. alm. t.* 53, *f.* 5, & 219, *f.* 1.

Dry soil, Maryland! Virginia! to Alabama! and west to Missouri! Louisiana! and Texas! July–Sept.—Stem 1–2 feet high. Lower leaves 3–5 inches long. Heads crowded, about 4 lines in diameter; the scales closely appressed. Ray inconspicuous.

§ 2. *Pappus of 2 oblong obtuse membranaceous squamellæ: root annual: leaves bipinnatifid.*—ARGYROCHÆTA, Cav., DC.

2. *P. Hysterophorus* (Linn.): hirsute-puberulent and somewhat canescent, diffusely branched or decumbent; leaves variously bipinnatifid; the uppermost linear and undivided; heads (very small) paniculate; exterior scales of the involucre somewhat acute.—*Linn. l. c.*; *bot. mag. t.* 2275; *Hook. in compan. to bot. mag.* 1. *p.* 99; *DC.! l. c.* Argyrocheta bipinnatifida, *Cav. ic.* 4. *p.* 54, *t.* 378. Villanova bipinnatifida, *Ort. dec. p.* 48, *t.* 6.

Banks of streams, New Orleans, *Drummond, Dr. Ingalls!* Texas, *Berlandier!* St. Augustine, Florida, *Baldwin!* Key West, *Mr. Blodgett!*

Also a native of Mexico and the West Indies.—Leaves resembling those of Ambrosia artimesiæfolia.

§ 3. *Pappus of 2 oblong-lanceolate membranaceous squamellæ, nearly the length of the short truncate tubular corolla: cæspitose, dwarf: heads solitary and nearly sessile among the spatulate-linear canescent leaves at the summit of each division of the ligneous caudex!*—BOLOPHYTA, Nutt.

3. *P. alpinum:* acaulescent; caudex branched, densely cæspitose, and crowned with the vestiges of former leaves and with a tuft of white hairs; leaves densely tufted, entire, silvery-canescent; corolla of the ray scarcely exserted, truncate, slightly 2-crenulate.—Bolophyta alpina, *Nutt.! in trans. Amer. phil. soc. (n. ser.) 7. p.* 347.

In the Rocky Mountains, towards the sources of the Platte, in about lat. 42°, on shelving rocks at the summit of a lofty hill, near the place called the 'Three Butes' by the Canadians, 7000 feet above the level of the sea. *Nuttall!* June.—Caudex fusiform, sending off several closely matted crowns of leaves; the latter an inch or an inch and a half in length, scarcely a line wide, tapering into short petioles, 1-nerved. Heads concealed among the leaves, about as large as those of P. integrifolium, and entirely similar in structure; except that the rays, if they may be so called, are shorter, entirely tubular, with an obscure emargination anteriorly and posteriorly. The pappus, which escaped Mr. Nuttall's notice, consists of a scarious ovate-lanceolate or triangular scale-like auricle or tooth on each side, which perhaps withers away as the achenium ripens. Excepting the habit, therefore, we find nothing whatever to distinguish this little plant from Parthenium, beyond the more reduced corolla of the ray.

Div. 5. IVEÆ, *DC.*—Fertile and sterile flowers in the same heads, all tubular, or the former rarely apetalous. Pappus coroniform, 4-awned, or none. Anthers approximate but distinct: filaments inserted towards the base of the corolla. Style of the fertile flowers mostly 2-parted.

77. CYCLACHÆNA. *Fresenius, ind. sem. hort. Franc.* 1836, *p.* 4, *& in Linnæa*, 12, *suppl. p.* 78.

(Polygamo-subdiœcious; the barren plant similar to the fertile, but not fertilizing its ovaries.) Fertile and sterile flowers in the same heads; the former 5, in the axils of the inner scales of the involucre, with no corolla or a mere rudiment; the latter 10–15, with an obconical 5-toothed corolla, (nearly destitute of proper tube); the central ones abortive. Scales of the flattish hemispherical involucre usually 10, in 2 series; the exterior 5, ovate, somewhat acuminate, thickish, herbaceous; the interior dilated-obovate, truncate, membranaceous, at length loosely wrapped around the achenia. Receptacle small, flat; the chaff linear-spatulate, usually wanting towards the centre. Anthers slightly united, tipped with an inflexed mucronate appendage. Style of the fertile flowers deeply 2-cleft, linear, acutish; in the sterile flowers undivided, radiate-penicillate at the apex. Achenia obovate, obcompressed, somewhat turgid, not margined, glabrous, entirely destitute of pappus; the staminate flowers with no rudiments of ovaries.—A tall and coarse

annual; the stem simple and more or less branched at the summit; the leaves opposite, ovate or subcordate, acuminate, doubly or unequally serrate, 3-nerved, hirsute-canescent or pubescent beneath, somewhat scabrous, on long petioles. Heads small, greenish, ebracteate, sessile and often glomerate, disposed in compound terminal and axillary spikes, forming a pyramidal panicle.

C. xanthiifolia (Fresenius, l. c.)—Iva xanthifolia, *Nutt.! gen.* 2. *p.* 185. I. (Picrotus) xanthifolia & paniculata, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 347.

In alluvial soil, Upper Missouri near Fort Mandan &c., *Nuttall! Prince Neu-wied* (seeds from which the plant was raised in the Frankfort Botanic Garden) to the Rocky Mountains, *Nuttall!*—Scales of the involucre somewhat hairy externally and ciliate, distinct, as long as the disk. Ovaries minutely somewhat hairy at the summit when young, at length glabrous; the corolla reduced to a minute ring surrounding the base of the style.—We are not sure that the plant is truly polygamo-dioecious, since the styles, in what Mr. Nuttall considers the sterile plant, are apparently perfect: the fertile ovaries of Iva ciliata are at first very small likewise: but in this plant the inner involucral scales are also proportionally reduced in size, so as to be readily overlooked, as indeed they have been by Mr. Nuttall. We have a specimen from a plant cultivated in Mr. Lambert's garden, exhibiting the heads in a somewhat monstrous state; the styles of the fertile flowers frequently 3 or 4, and those of the exterior sterile 2-cleft; the former showing an evident corolla; the corolla of the disk-flowers 10-nerved; the receptacle towards the margin furnished with dilated and somewhat cucullate chaff; while in the wild plant the chaff is often nearly or quite wanting.—Excepting its entire opposite leaves, this plant has the habit as well as the inflorescence and many of the characters of Euphrosyne, *DC.* (*DeLess. ic.* 4. *t.* 28); of which, indeed, it might be deemed a section, should that genus prove to have an inner series of involucral scales, similar to that which is represented in the figure as one of the paleæ of the receptacle.

78. IVA. *Linn.; Gærtn. fr. t.* 164; *DC. prodr.* 5. *p.* 529.

Fertile and sterile flowers in the same heads; the former few (1–5), marginal, with a small tubular corolla; the latter several (7–20, rarely only 2 or 3), with a tubular-campanulate or infundibuliform 5-toothed corolla. Scales of the campanulate or hemispherical involucre 3–5 in a single series, and often more or less united, or 6–9 and imbricated, usually ovate or orbicular and somewhat fleshy. Receptacle small, chaffy; the chaff linear or spatulate. Anthers sometimes with a mucronate inflexed appendage, distinct or nearly so. Style in the fertile flowers deeply 2-cleft; the branches linear or linear-subulate, one of them often imperfect; in the sterile flowers undivided, usually with the apex radiate-penicillate. Achenia obovoid, somewhat obcompressed, wholly destitute of pappus; the sterile flowers with rudimentary ovaries.—Herbaceous or shrubby commonly maritime (American) plants. Leaves opposite or the upper alternate, often thick or fleshy, 1–3-nerved. Heads solitary or ternate in the axils of the upper leaves, or of foliaceous bracts, forming spikes or spicate racemes, deflexed. Corolla greenish-white. Anthers yellow.

§ 1. *Involucre several-flowered, composed of* 3–5 *distinct and nearly* 1-*seriate, or partly united scales.*

1. *I. ciliata* (Willd.): annual, hirsute or hispid, branched; leaves opposite, on slender hispid or ciliate petioles, ovate, acuminate, coarsely and irregularly serrate-toothed, scabrous above, softly pubescent or slightly canescent beneath; the upper ones ovate-lanceolate; spikes dense, elongated, paniculate; the conspicuous lanceolate or ovate-lanceolate bracts, and the (3–4, distinct) roundish unequal scales of the involucre, hispidly ciliate; fertile flowers mostly 3; chaff of the receptacle linear-filiform.—*Willd. spec.* 3. *p.* 2386; *Pursh, fl.* 2. *p.* 580; *DC. l. c.* I. annua, *Michx.! fl.* 2. *p.* 184, not of *Linn.* Ambrosia (vel Iva) Pitcheri, *Torr.! mss.* (*in herb. Hook.*); *Hook. compdn. to bot. mag.* 1. *p.* 99.

β. bracts linear and much elongated, ciliate only near the base.—Ambrosia Pitcheri *β.*, *Hook. l. c.*

Swamps and moist places, Illinois! and Missouri! to Louisiana! Arkansas! and Texas! common. Aug.–Oct.—Plant 2–6 feet high, coarse and weed-like in appearance, with much the habit of an Ambrosia. Leaves 3–4 inches long. Spikes 3–6 inches long, numerous; the bracts longer (in *β.* many times longer) than the deflexed almost sessile heads. Scales of the involucre 3, rarely 4 or 5, very obtuse, unequal. Fertile flowers sometimes 4 or 5, inconspicuous when young; the corolla slender, truncate. Achenia obovate, lenticular. Sterile flowers 10–15, greenish; the style penicillate at the apex.

2. *I. frutescens* (Linn.): shrubby, nearly glabrous, much branched; leaves opposite or the upper ones alternate, a little fleshy, oval or lanceolate, somewhat scabrous, coarsely and sharply serrate; the uppermost, or bracts, linear-lanceolate, entire; heads depressed-globose, somewhat pedicellate, solitary or in pairs in the axils of the bracteal leaves, forming foliaceous paniculate racemes; scales of the involucre 5, orbicular, glabrous, distinct; fertile flowers 5; chaff of the receptacle linear-filiform.—*Linn.! amœn. acad.* 3. *p.* 25, & *spec.* 2. *p.* 989; *Walt.! Car. p.* 232; *Lam. ill. t.* 106. *f.* 2; *Michx.! fl.* 2. *p.* 184; *Willd. l. c.*; *Pursh! fl.* 2. *p.* 580; *Ell. sk.* 2. *p.* 475; *Bigel. fl. Bost. ed.* 2. *p.* 317; *DC.! l. c.*

Sea-coast, and muddy shores of large rivers near the ocean, Massachusetts! to Florida! and Louisiana; common. July–Sept.—Shrub 3–8 feet high; the stems annually dying down to near the ground in the Northern States. Leaves of a greyish hue, sometimes ternate. Heads recurved, greenish. Corolla of the fertile flowers very small, 2–3-toothed. Achenia when young sprinkled with resinous dots as in most other species.—***Marsh Elder.***

3. *I. axillaris* (Pursh): much branched from the somewhat ligneous base, low, covered with minute appressed hairs or nearly glabrous; leaves alternate or the lower opposite, fleshy, lanceolate-linear, oblanceolate, or spatulate-oblong, entire, obscurely 1–3-nerved, narrowed at the base, sessile; heads solitary in the axils of the leaves, on short recurved pedicels; scales of the campanulate involucre 4–5, distinct, or united to the middle; fertile flowers 4–5; chaff of the receptacle filiform-linear.—*Pursh! fl.* (*suppl.*) 2. *p.* 743; *Nutt.! gen.* 2. *p.* 185; *Hook.! fl. Bor.-Am.* 1. *p.* 309, *t.* 106. I. axillaris & I. foliolosa, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 346.

Dry sandy and saline soil, Upper Missouri, *Bradbury! Nuttall! Mr. Nicollet!* Saskatchawan, *Drummond!* &c. and on the Oregon from the Rocky Mountains to the Grand Rapids, *Douglas!* May–July.—Root annual according to Pursh and Hooker, 'perennial & herbaceous,' *Nuttall*, certainly perennial or even ligneous in the fine specimens collected by Mr. Nicollet. Stems ascending, a span to a foot high; the plant with much the

habit of Glaux maritima. Leaves about an inch long, varying from 2 lines to half an inch in breadth, pale; the close strigose pubescence (traces of which are almost always visible with a lens) scarcely perceptible to the naked eye except on the margins. The involucral scales are sometimes nearly or quite distinct (I. axillaris, *Nutt. l. c.* excluding the reference to Hooker); sometimes variably united, as described and figured by Hooker, when it is the I. foliolosa, *Nutt. l. c.* But Mr. Nicollet's specimens from the Missouri (in which the leaves are as evidently 3-nerved and hairy as in any state of the species,) have the scales in some instances united to the middle, while more commonly they are nearly distinct.

4. *I. microcephala* (Nutt.): stem slender, glabrous, virgately branched; heads very small, nearly sessile in the axils of the narrowly linear and fleshy sessile entire alternate leaves, nodding; scales of the involucre 4–5, distinct; flowers about 6, three of them pistillate.—*Nutt.! in trans. Amer. phil. soc. l. c.*

Florida, *Dr. Baldwin!*—Leaves about half an inch long and half a line wide: the capitula not larger than an ordinary pin's head. *Nutt.*

§ 2. *Scales of the many-flowered involucre* 6–9, *imbricated in* 2–4 *series.*

5. *I. imbricata* (Walt.): perennial, herbaceous or nearly so, mostly glabrous; branches ascending; leaves commonly alternate, fleshy, lanceolate, mucronulate, tapering to the base, sessile, obscurely 3-nerved, entire or denticulate serrate; heads solitary or in pairs in the axils of the upper leaves, on short pedicels, forming foliaceous spikes or racemes; exterior scales of the involucre orbicular, fleshy, with a narrow scarious margin; the interior obovate, the scarious margin lacerate-denticulate; fertile flowers 2–4; chaff of the receptacle linear-spatulate, denticulate at the summit.—*Walt.! Car. p.* 232; *Michx.! fl. 2. p.* 184; *Pursh! fl. 2. p.* 580; *Ell.! sk. 2. p.* 475; *DC.! prodr. 5. p.* 530.

Sandy sea-shore, N. Carolina! to Florida! and Louisiana! Also Key West, *Mr. Blodgett!* July–Oct.—Plant 1–2 feet high, suffrutescent at the base. Leaves about an inch long. Corolla of the fertile flowers very small and short, 5-parted or irregularly cleft. Fertile style divided nearly or quite to the base; the branches linear, rather obtuse, one of them sometimes abortive. Sterile flowers numerous. Achenia slightly compressed.—"Leaves of the fertile branches linear; of the barren ones cuneate-obovate and serrate-toothed: the plant has an extremely strong odor of honey." *M. A. Curtis, mss.*

§ 3. *Involucre turbinate, composed of* 3 *scales united nearly to the summit,* 3–6-*flowered, the fertile flowers solitary.*—Monachæna.

6. *I. angustifolia* (Nutt.): annual, strigose-pubescent: stem erect or decumbent at the base, much branched; leaves narrowly linear or lanceolate-linear, 1–3-nerved, tapering at the base or somewhat petioled, entire, the lower often denticulate; heads (small) subsessile, deflexed, forming narrow virgate leafy spikes; chaff of the receptacle filiform, minute.—*Nutt.! in DC. prodr. 5. p.* 529, & *in trans. Amer. phil. soc. l. c.*

Prairies, Arkansas, *Nuttall! Dr. Leavenworth!* Western Louisiana, *Dr. Hale!* Texas, *Drummond! Dr. Leavenworth!* Aug.–Sept.—Stem 1–3 feet high. Leaves &c. minutely pubescent and somewhat canescent with appressed strigose hairs; the lower 1–2 inches long and 1–3 lines wide; the upper much narrower; the bracteal ones almost setaceous. Spikes very numerous, 4–6 inches long. Heads scarcely more than a line in length, frequently with only 3 flowers, two of them staminate. Sterile style abor-

tive, short, glabrous, not thickened at the summit. Achenium somewhat compressed.

79. PICROTHAMNUS. *Nutt. in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 417.

Fertile and sterile flowers in the same heads; the former 3–5, marginal, with a very small obliquely truncate and obscurely 2–3-toothed corolla; the latter about 10, with an infundibuliform 5-toothed corolla, inflated at the summit. Scales of the depressed-hemispherical involucre about 5, orbicular, distinct. Receptacle flat, naked. Sterile flowers destitute of ovaries; the anthers slightly united, tipped with an inflexed mucronate appendage; the abortive style entire, with a radiate-penicillate summit. Style in the fertile flowers deeply 2-cleft; the branches subulate-linear, glabrous. Achenia obovoid-oblong, terete, entirely clothed, as well as their corollas, and the tube of the sterile corolla, with very long and tortuous woolly hairs.—A low rigid suffruticose plant, with the habit of Artemisia, canescently pubescent, much branched; the branches spinescent. Leaves small, alternate or crowded, petioled, pedately or 2-ternately divided. Heads small, in short and somewhat loose racemes or spikes; the rachis persistent and spinescent. Flowers pale yellow.

P. desertorum (Nutt.! l. c.)

Arid deserts in the Rocky Mountains, towards the north sources of the Platte, *Nuttall!*—Plant bitter to the taste (whence the name), 4–18 inches high.—Mr. Nuttall doubtfully refers it to Millerieæ, next to Clibadium: but the heads and flowers entirely accord with Iva, except in the naked receptacle, and the woolly hairs of the achenia and corolla.

Div. 5.[6] AMBROSIEÆ, *DC.*—Fertile and sterile flowers in different heads on the same individual; the former (1–4) often apetalous; the latter tubular. Scales of the involucre in the fertile heads united into an ovate or oblong persistent covering, including or closely investing the flowers and fruit, often prickly or spinose. Pappus none. Anthers approximate, but distinct or very slightly united: filaments inserted at the base of the corolla.

80. AMBROSIA. *Tourn.; Linn.; Gærtn. fr. t.* 164; *Schkuhr, handb. t.* 292; *DC. prodr.* 5. *p.* 524.

Sterile heads occupying the upper portion, the fertile at the base of the racemes or spikes, or in the axils of the upper leaves. STERILE FL. Involucre flattish, hemispherical, or somewhat turbinate, composed of 7–12 united scales, 5–20-flowered. Receptacle flattish, naked, or usually with filiform chaff among the flowers. Corolla infundibuliform or turbinate, 5-toothed. Anthers tipped with a mucronate-setigerous inflexed appendage. Ovary none or rudimentary: abortive style included, minutely fimbriate or radiate-penicillate at the summit. FERTILE FL. Involucre globose-ovoid, oblong, or turbinate, closed, pointed, usually armed near the summit with 4–8 tuber-

cles or horns in a single series, 1-flowered. Corolla none. Stamens none. Branches of the style filiform, elongated. Achenium ovoid or obovoid.—Herbaceous or rarely suffrutescent weed-like plants (chiefly American), with opposite or alternate mostly lobed leaves. Branches terminating in racemes or spikes, which are simple and sterile above. Sterile heads ebracteate. Fertile heads clustered at the base of the sterile spikes and bracteate, or sessile in the axils of the upper leaves. Corolla whitish.

Lessing, De Candolle &c. distinguish Franseria from Ambrosia by the chaffy receptacle of the sterile flowers, the presence of an abortive style, and the echinate fertile involucre as in Xanthium, which moreover in Franseria proper (§ Xanthiopsis, *DC.*) is said to be 2–4-celled: but that genus must depend upon the latter characters alone (at least so far as the section Centrolæna is concerned, of which only we have seen specimens); for all the species of Ambrosia we have examined have a sterile style, and all but A. trifida and A. artemisiæfolia exhibit the same chaffy receptacle as in Franseria. In the Mexican A. fruticosa *var.* canescens, *Benth. pl. Hartw.*, the chaffy scales are conspicuously dilated at the summit. No one appears to have remarked the setiform inflexed appendage of the anthers in these plants.—A. bidentata, *Michx.* might perhaps be properly separated from the genus.

§ 1. *Sterile heads more or less pedicellate; the involucre regular, with the margin crenate or nearly entire: fruit (fertile involucre) subglobose or obovoid.*—EUAMBROSIA.

* *Involucre of the sterile heads 3-ribbed: receptacle naked: fertile heads glomerate at the base of the sterile spiciform racemes; the clusters somewhat involucrate: leaves opposite, undivided or palmately 3–5-lobed.*

1. *A. trifida* (Linn.): stem tall and stout, hairy, rough; leaves scabrous and hairy, deeply 3-lobed; the lobes oval-lanceolate, acuminate, serrate; the lower leaves often 5-lobed; petioles narrowly winged, ciliate; racemes often paniculate; fruit (fertile involucre) turbinate-obovoid, with a short conical pointed apex, 6-ribbed, the ribs terminating in as many cristate tubercles.—*Linn.! spec.* 2. *p.* 987; *Michx.! fl.* 2. *p.* 183; *Willd.! spec.* 4. *p.* 375; *Pursh, fl.* 2. *p.* 581; *Ell.! sk.* 2. *p.* 476; *DC.! prodr.* 5. *p.* 527; *Darlingt. fl. Cest. p.* 479; *Hook. fl. Bor.-Am.* 2. *p.* 26. A. Virginiana &c., *Moris. hist.* 3. *sect.* 6. *t.* 1, *f.* 4.

β. integrifolia: leaves ovate or oval-oblong, acuminate, sometimes the upper, and often the lower ones 3-lobed.—A. integrifolia, *Muhl. in Willd.! l. c.*; *Pursh, fl.* 2. *p.* 580; *DC. l. c.*

Low grounds and along streams, Canada! to Georgia! and west to Louisiana and Arkansas! Aug.–Sept.—☿ Stem 4-sided, 4–9 feet high (sometimes 20 feet or more! according to Dr. Boykin), branching above. Leaves large. Involucre of the sterile heads with 3 strong dark purple radiate ribs, occupying the side farthest from the axis of the raceme. Corolla greenish-white, cyathiform-campanulate, scarcely attenuate at the base. Fruit 3–4 lines long.—A coarse unsightly plant.

** *Involucre of the sterile heads not ribbed: receptacle usually chaffy; the chaff filiform, or rarely dilated at the summit, rather shorter than the corolla: fertile heads solitary or glomerate towards the base of the sterile spikes or racemes, or in the axils of the upper leaves; the clusters somewhat involucrate: leaves 1–2-pinnately cleft or parted, alternate, the lower opposite.*

2. *A. crithmifolia* (DC.): suffruticose and prostrate at the base; the flow-

ering stems erect or ascending, velvety-hirsute at the summit; leaves nearly all opposite, petioled, rather thick, bipinnatifid, when young hirsute-tomentose on both sides; spikes few, the terminal one much longest; receptacle of the sterile flowers chaffy; fruit (fertile involucre) obovoid, villous when young, unarmed.—*DC.! prodr.* 5. *p.* 525.

Sea-shore, Key West, *Mr. Bennett! Mr. Blodgett!*—Whole plant somewhat hirsute-canescent, 12–15 inches high. Lower leaves bipinnatifid; the ultimate segments short; the uppermost occasionally alternate, often simply pinnatifid; the segments linear, entire or 1–2-toothed. Fertile involucre with about 4 obscure inflexed teeth near the summit.

3. *A. artemisiæfolia* (Linn.): annual; stem sparsely or rather densely villous, or pubescent, paniculately branched; leaves bipinnatifid, minutely strigose-pubescent, almost glabrous above, paler and frequently somewhat canescent beneath; the uppermost simply pinnatifid; the lower opposite; petioles ciliate or hirsute; racemes spicate, paniculate; receptacle of the sterile flowers naked; fertile heads solitary or glomerate along the lower part of the racemes and bracteate, or in the axils of the upper leaves; fruit obovoid or subglobose, nearly glabrous, pointed, armed with about 6 short acute spines or teeth.—*Linn.! spec.* 2. *p.* 988; *Lam. ill. t.* 765. *f.* 1; *Willd.! spec.* 4. *p.* 376; *Ell. sk.* 2. *p.* 477; *DC.! prodr.* 5. *p.* 526. A. elatior, *Linn.! l. c.*; *Willd.! l. c.*; *Pursh! fl.* 2. *p.* 581; *Ell. l. c.*; *Bigel. fl. Bost. ed.* 2. *p.* 343; *Hook.! fl. Bor.-Am.* 1. *p.* 309; *Darlingt. fl. Cest. p.* 479; *DC.! l. c.* A. absynthifolia, *Michx.! fl.* 2. *p.* 183.

β. cauline leaves 1–2-pinnatifid; those of the branches nearly sessile; the uppermost lanceolate, undivided, or somewhat lobed at the base.—A. heterophylla, *Muhl. in Willd.! spec.* 4. *p.* 378; *Pursh, l. c.*; *DC. l. c.*

γ. fertile heads glomerate in the axils of the leaves and on short axillary branchlets or spikes, and more or less racemose or paniculate; the sterile racemes very short.

δ. less pubescent; fruit (usually rather smaller) with the spines or teeth very short or obsolete.—A. paniculata, *Michx.! fl.* 2. *p.* 183; *Willd.! l. c.*; *Ell. l. c.*; *DC.! l. c.*; *Hook. l. c.* partly! Iva monophylla, *Walt.! Car. p.* 232.

Dry fields and pastures, roadsides, and waste places, Canada! to Florida! Louisiana! and Texas! often a troublesome weed in cultivated grounds. (California, ex *Hook. & Arn. bot. Beechey.*) July–Sept.—Stem 1–3 or 4 feet high, at length much branched; the plant variable as to pubescence, &c. Fruit a line to a line and a half in length; the spines or teeth certainly variable, and sometimes inconspicuous or almost none.—Of the two Linnæan names, the one we have preferred is the most appropriate.—*Bitter-weed. Rag-weed. Hog-weed.*

4. *A. coronopifolia:* annual? canescent-strigose, at length much branched, leaves crowded, rigid; the upper lanceolate or oblong-lanceolate, sessile; deeply and somewhat remotely pinnatifid or incised; the lower opposite and somewhat bipinnatifid, on short margined petioles: sterile heads in loose spicate racemes, the receptacle chaffy; fertile heads solitary or somewhat clustered at the base of the sterile spikes and in the axils of the upper leaves; fruit globose-ovoid, turgid, unarmed, obtusely pointed, hairy.—A. hispida, *Torr.! in ann. lyc. New York*, 2. *p.* 216, doubtless not of *Pursh.*

Prairies of Illinois! Missouri, (north to Devil's Lake, *Mr. Nicollet!*) Louisiana! and Texas! Aug.–Sept.—Stem erect, 1–5 feet high, often rough or almost hispid. Leaves very numerous, sometimes nearly all opposite, 2–5 inches long, clothed with very closely appressed hairs, both sides more or less canescent when young, sprinkled with minute resinous globules; the segments rather distant, spreading, oblong or lanceolate. Sterile racemes or spikes proportionally shorter than in the preceding; the heads scarcely

larger: involucre minutely hispid. Chaff of the receptacle filiform. Mature fruit twice as large as in A. artemisiæfolia, pubescent towards the summit, obscurely triangular at the base, entirely destitute of teeth or horns.

5. *A. longistylis* (Nutt.): annual, scabrous; stem (apparently) simple; leaves pinnatifid; the segments oblong-linear; bracts entire; fertile flowers axillary, conglomerate, with exceedingly long styles; fruit cornute, spiny at the summit; sterile flowers about 30, in a slightly toothed involucre; the receptacle filiformly paleaceous; cusps of the anthers filiform. *Nutt.! in trans. Amer. phil. soc. l. c. p.* 344.

Rocky Mountains: allied to Franseria, *Nuttall!*—Plant strigose-hispid.

§ 2. *Sterile heads closely sessile, densely aggregated in a cylindrical sessile spike terminating the stem or branches; the involucre turbinate, truncate, the inner margin produced into a long and conspicuous lanceolate, hispid, decurved or cucullate tooth or appendage: receptacle chaffy: fruit (fertile involucre) oblong, 4-angled and somewhat prismatic, solitary or clustered in the axils of the lanceolate closely sessile 1-nerved leaves.*—CERCOMERIS.

6. *A. bidentata* (Michx.): annual; stem hirsute with spreading hairs; the branches simple; leaves very numerous, mostly alternate, hirsute or hispid, partly clasping, commonly with a short spreading lobe or broad tooth on each side near the base, entire above, or rarely remotely serrate, acute; sterile spike squarrose with the recurved very hispid appendage of the involucres; receptacle small, about 10-flowered; the filiform scarious chaff much shorter than the corolla; fruit acutely pointed; the 4 angles or ribs terminating in short acute spines.—*Michx.! fl.* 2. *p.* 182: *Pursh, fl.* 2. *p.* 581.

Prairies of Illinois! Missouri! Arkansas! and Louisiana! July–Sept.—Stem 1–3 feet high. Leaves 1–2 inches long. Sterile spikes very dense; the appendages of the involucres, which are twice or thrice the length of the involucre itself appearing like recurved bracts. Fertile heads numerous, minutely pubescent, when mature about 4 lines long, including the rigid and sharp terminal horn or cusp. Achenium conformed to the cavity of the involucre.

‡ *Doubtful Species.*

7. *A. hispida* (Pursh): canescent-hispid throughout; leaves bipinnatifid, the segments incised; racemes terminal, somewhat paniculate. *Pursh, fl.* (*suppl.*) 2. *p.* 743.

South Carolina, *Catesby* (*Herb. Sherard.*) About a foot high: flowers larger than in A. trifida. *Pursh.*

8. *A. tomentosa* (Nutt.): perennial; stem low; leaves bipinnatifid, the lower side white and tomentose; spikes solitary. *Nutt. gen.* 2. *p.* 186

Upper Missouri: rare; 1–2 feet high. *Nuttall.*

81. FRANSERIA. *Cav. ic.* 2. *t.* 200; *Willd. hort. Berol. t.* 2; *DC.*

Sterile heads occupying the upper portion, the fertile the base of the racemes or spikes. STERILE FL. Involucre hemispherical, composed of 8–12 united scales, 15–20-flowered. Receptacle flattish, chaffy; the chaff filiform. Corolla infundibuliform, 4–5-toothed. Anthers tipped with a mucronate-setigerous inflexed appendage. Ovary none: abortive style included,

radiate-penicillate at the summit. FERTILE FL. Involucre ovoid or oblong, closed, covered with uncinate or spinescent prickles (composed therefore of numerous pluriseriate united scales, each tipped with a prickle), 1–4-celled, with a single flower in each. Corolla none, or a rudiment appressed to the base of the style. Stamens none. Branches of the style filiform, obtuse at the summit. Achenia oblong.—Herbaceous or suffrutescent (American) plants, with alternate coarsely toothed or lobed, or 1–2-pinnately parted leaves; the fertile heads somewhat aggregated at the base of the sterile spikes or racemes; the evolution of the latter mostly centripetal! Sterile heads ebracteate.

§ *Fertile involucre* (1-*celled*) *armed with straight spines*.—CENTROLÆNA, DC.

* *Perennial or suffruticose.*

1. *F. Chamissonis* (Less.): hirsute-canescent; stems decumbent, stout; leaves roundish-elliptical, crenate-toothed, abruptly narrowed into a long petiole; involucre of the densely spicate sterile heads 10–12-toothed, hirsute; spines of the fructiferous involucre short and very stout; achenia large.—F. Chamissonis *a.* malvæfolia, *Less. in Linnæa*, 5. *p.* 507; *DC. l. c.*

β. cuneifolia: leaves oval or elliptical, tapering by a cuneate 3-nerved base into a long petiole; the upper often incisely toothed.—F. cuneifolia, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 345.

Coast of California, *Chamisso.* *β.* Mouth of the Oregon, *Nuttall!*—Stem (ligneous at the base, *Less.*; succulent, *Nutt.*) 1–2 feet long.—Lessing remarks that one of his specimens has the uppermost leaves bipinnately divided; and in Nuttall's specimens they are sometimes incised; so that the following different as it appears, may not be distinct.

2. *F. bipinnatifida* (Nutt.): herbaceous; stems decumbent, villous-hirsute; leaves silky-canescent, bipinnately divided; the ultimate segments linear, short, obtuse, sometimes 1–2-toothed; sterile heads in a dense spicate raceme, with nearly glabrous 10–12-toothed (about 30-flowered) involucres; spines of the fructiferous involucre short and very stout.—*Nutt.! l. c.* F. Chamissonis *β.* pinnatisecta, *Less. l. c.*; *DC.! l. c.* Ambrosia paniculata, *Hook. fl. Bor.-Am.* 1. *p.* 309, as to spec. from N. W. Coast! (but our specimen has no flowers.)

Coast of California, very common, *Chamisso, Douglas! Nuttall!* Nootka, *Dr. Scouler!*

3. *F. pumila* (Nutt.! l. c.): silky-canescent; leaves on long petioles 3-pinnatifid; the ultimate segments linear-oblong, crowded; sterile involucres 5–7-toothed, about 12-flowered.

St. Diego, California, *Nuttall!*—Plant 4–6 inches high. Spike not exserted beyond the leaves. We have not seen the fruit.

4. *F. discolor* (Nutt.! l. c.): root creeping; leaves interruptedly bipinnatifid, nearly smooth above, closely canescent-tomentose beneath; segments subovate, acute, confluent on the wide rachis; stem short, with the lateral branches decumbent; sterile involucres about 5–6-toothed. *Nutt.*

Rocky Mountains near the Colorado of the West. A very remarkable and distinct species. Stems about a span long, slightly pubescent. Leaves with a lanceolate outline, about 6 inches long. Fertile flowers few: fruit spiny. *Nuttall.*—We have not seen the fully developed flowers, nor the fruit.

* * *Annual.* (Ambrosidium, *Nutt.*)

5. *F. Hookeriana* (Nutt.): much branched, paniculate; stem scabrous and more or less hirsute; leaves bipinnatifid, with few oblong or somewhat linear segments, strigose-canescent; racemes paniculate; sterile involucres 5–8-cleft, 10–20-flowered; the fructiferous involucre covered with (12 or more) long and slender flattish spreading spines.—F. Hookeriana & F. montana, *Nutt.! l. c.* Ambrosia acanthicarpa, *Hook.! fl. Bor.-Am.* 1. *p.* 309.

Saskatchawan to the Oregon River, *Douglas! Drummond!* and near the sources of the Colorado of the West, *Nuttall!*—Fertile portion of the racemes often as long as the sterile, frequently leafy at the base and partly compound. Sterile heads small, on filiform pedicels.

82. XANTHIUM. *Tourn. inst. t.* 252; *Linn.*; *Gærtn. fr. t.* 164; *Schkuhr, handb. t.* 291; *DC. l. c.*

Heads glomerate-spicate; the spikes sterile at the summit. STERILE FL. numerous in subglobose heads; the scales of the involucre distinct, in a single series. Receptacle oblong or cylindraceous, chaffy. Stamens inserted in the base of the short and dilated 5-toothed and somewhat hairy corolla: anthers distinct, but connivent. Style abortive, undivided. FERTILE FL. two, enclosed in a 2-celled ovoid or oblong coriaceous closed involucre, which is clothed with hooked prickles and terminated by 1 or 2 stout beaks. Corolla filiform. Stamens none. Branches of the style linear-filiform. Achenia solitary in each cell of the involucre, oblong, flat.—Coarse annual weeds, with branching stems, and alternate, petioled, lobed or toothed leaves.

§ 1. *Leaves cordate, lobed, incised, or toothed, with no spines at their base: fructiferous involucre with 2 beaks.*—Euxanthium, *DC.*

1. *X. strumarium* (Linn.): fructiferous involucre oval, somewhat pubescent; the beaks straight (appressed or spreading); leaves 3–5-lobed incisely-toothed; the lobes acute.—*Linn. spec.* (*ed.* 2) *p.* 1400; *Fl. Dan. t.* 270; *Lam. ill. t.* 765, *f.* 1; *Engl. bot. t.* 2544; *DC.! prodr.* 5. *p.* 523.

β. Canadense: fructiferous involucre pubescent-scabrous, or at length glabrous; the beaks straight or slightly incurved; stem usually spotted.—X. majus Canadense, *Herm. Lugd. p.* 635! X. elatius Americanum, &c., *Moris. hist.* 3. *p.* 604. *sect.* 15. *t.* 2, *f.* 2? X. Canadense, *Mill. dict. no.* 2? *Hook. & Arn. bot. Beechey, p.* 148. X. Carol. medium, *Dill. Elth. t.* 321? excl. *fig.* 13–16. X. Americanum, *Walt. Car. p.* 231? X. macrocarpon *β.* glabratum, *DC. l. c.* X. strumarium, *Michx. fl.* 2. *p.* 182; *Ell. sk.* 2. *p.* 479?

Waste places, around barnyards, &c., apparently introduced. Also Key West, Florida, *Mr. Blodgett!* (with fruit a little smaller than the European plant, the beaks appressed.) *β.* Fields, &c., Canada! Northern and Western States! and probably in the Southern States. Also in California, *Hook. & Arn.* July–Sept.—The true X. strumarium is more or less naturalized; the var. *β.* is probably indigenous, and perhaps a distinct species; but we can indicate no further characters to distinguish it, except that the fruit is in general a little larger than in the European plant, and the leaves perhaps less lobed.—*Burr-weed. Cockle-burr. Clot-burr.*

2. *X. echinatum* (Murray): fructiferous involucre oval, very densely clothed with rigid slender prickles, which are strongly hispid, as well as the

more or less incurved beaks; stem and petioles rough and strigose, spotted; leaves scabrous, broadly subcordate, obtuse, irregularly repand-toothed, obscurely lobed.—*Murr. comm. Gœtt.* 6 (1783–84) *p.* 32, *t.* 4 (good figure); *Willd. spec.* 4. *p.* 374. X. maculatum, *Raf.! in Sill. jour.* 1. *p.* 151. X. orientale, *Muhl. cat. p.* 89; *Nutt. gen.* 2. *p.* 186; *Torr.! cat. pl. New York, p.* 73; not of *Linn.* X. macrocarpon, *DC.! prodr.* 5. *p.* 523, in part; *Beck, bot. p.* 210.

β. prickles of the oval-oblong fructiferous involucre stouter and less crowded; leaves incisely lobed.

Waste places near salt water, Massachusetts! and New York! to Carolina! *β.* Banks of Spirit Lake, head-waters of the Little Sioux River of the Missouri. *Mr. Nicollet!* Aug.–Oct.—A stout and very coarse plant, 1–2 feet high. Mature fruit about an inch and a quarter long, turgid, three-fourths to nearly an inch broad, including the slender but rigid recurved-spreading prickles with which it is very densely invested, and which, as well as the beaks, are clothed with rigid bristly hairs. This is certainly different from the X. macrocarpon, *DC.*, which has an oblong fruit with very stout, suberect and scattered prickles. Murray's plant was raised from seeds collected at New York by Wangenheim. We have never met with it at a distance from the sea-coast, except the specimens of var. *β.*, which are, however, from a region which abounds in salt marshes. These indeed approach X. macrocarpon, and may prove to belong to that species; but they are apparently in a stunted state.

§ 2. *Leaves narrowed into the petiole, furnished with spines at their base: fructiferous involucre with a single beak.*—Acanthoxanthium, *DC.*

3. *X. spinosum* (Linn.) : spines at the base of the leaves 3-parted, slender; stem much branched; leaves ovate-lanceolate, cuneate at the base, entire or somewhat 3-lobed, with the middle lobe prolonged, acuminate, the lower surface and the veins of the upper canescent; involucre cylindrical-oblong, with an inconspicuous beak; the prickles slender.—*Linn. spec.* (*ed.* 2) 2. *p.* 1400; *Lam. ill. t.* 655, *f.* 4; *Ell. sk.* 2. *p.* 479; *DC.! prodr.* 5. *p.* 523.

Naturalized in many places along the coast from Massachusetts! to Georgia! Sept.–Nov.—Heads few, or solitary and sessile in the axils. Spines yellowish.

Subtribe 2. HELIANTHEÆ, *Less.*—Heads heterogamous and radiate, rarely homogamous and discoid; the disk-flowers perfect. Receptacle chaffy. Lobes of the corolla in the perfect flowers often somewhat thickened and papillose. Anthers blackish, not caudate at the base. Pappus either wanting, or coroniform, or of awns which are sometimes chaffy or with chaffy scales intermixed, never of capillary bristles, nor of several uniform and distinct chaffy scales.—Leaves commonly opposite.

CONSPECTUS OF THE GENERA.

Div. 1. HELIOPSIDEÆ.—Rays fertile, rarely none. Achenia with a thick outer integument, not obcompressed.

83. MELANTHERA. Rays none. Pappus of few rigid caducous bristles.
84. ZINNIA. Rays persistent. Pappus 1–2-awned, persistent.
85. WYETHIA. Rays numerous. Pappus coroniform-toothed and 1–3-awned.

86. BALSAMORHIZA. Rays numerous. Pappus none. Receptacle flat.

87. HELIOPSIS. Rays 10–15. Pappus none. Receptacle conical.

88. TETRAGONOTHECA. Rays 6–9. Pappus none. Scales of the exterior involucre 4, foliaceous, united towards the base.

89. HALEA. Rays 6–12. Pappus of numerous distinct, small and rigid scales. Exterior involucre of 4–5 foliaceous scales united below.

305 *Div.* 2. EUHELIANTHEÆ.—Rays sterile. Achenia never obcompressed.

* *Pappus coroniform, somewhat 2-toothed, or none.*

+ Receptacle conical or columnar.

90. ECHINACEA. Achenia quadrangular. Chaff with a cartilaginous cusp.

91. RUDBECKIA. Achenia quadrangular. Chaff navicular or concave.

92. LEPACHYS. Achenia compressed, somewhat 1–2-winged, 1–2-toothed. Chaff truncate.

93. DRACOPIS. Achenia terete. Chaff linear.

+ + Receptacle flat or convex.

94. GYMNOPSIS. Pappus coroniform. Achenia enclosed in the chaff.

95. ENCELIA. Pappus none. Margins of the compressed achenia villous.

* * *Pappus aristiform or squamelliform.*

96. VIGUIERA. Pappus of 4 squamellæ and 2 awns. Involucre scarcely imbricated.

97. HELIANTHUS. Pappus of 2 chaffy awns and often 2–4 squamellæ, caducous. Involucre imbricated. Achenia wingless.

98. HELIANTHELLA. Pappus lacerate-toothed or awned at the angles. Achenia slightly winged or margined.

99. ACTINOMERIS. Pappus of 2 persistent awns. Achenia winged.

337 *Div.* 3. COREOPSIDEÆ.—Rays sterile. Achenia obcompressed, not rostrate. Awns not retrorsely hispid.

100. AGARISTA. Achenia villous. Pappus of 2 long chaffy scales.

101. COREOPSIS. Achenia mostly glabrous.

349 *Div.* 4. BIDENTIDEÆ.—Rays sterile. Achenia either obcompressed or rostrate. Awns retrorsely hispid.

102. COSMOS. Achenia rostrate. Awns deciduous. Chaff slender.

103. COSMIDIUM. Achenia not rostrate. Awns persistent. Chaff short and obtuse. Disk-corolla deeply cleft.

104. BIDENS. Achenia rostrate or erostrate. Awns persistent. Disk-corolla 5-toothed.

354 *Div.* 5. VERBESINEÆ.—Rays fertile, rarely none. Achenia mostly compressed or obcompressed, with a thin exterior integument.

* *Achenia all obcompressed. Disk-corolla with a barbellate ring. Involucre double.*

105. LEPTOSYNE. Pappus minute and cup-shaped. Rays 8–15.

106. TUCKERMANNIA. Pappus none. Rays 15–20.

* * *Achenia, at least those of the disk, compressed.*

107. SPILANTHES. Receptacle conical. Appendages of the style truncate. Rays deciduous, often none.

108. LIPOCHÆTA. Receptacle flattish. Achenia awned from the angles, and with chaffy or squamellate teeth between the awns.

109. VERBESINA. Receptacle flattish. Achenia 2-awned. Rays few or none.

110. XIMENESIA. Receptacle convex. Achenia of the disk 2-awned and winged, of the ray wingless. Rays numerous.

111. SANVITALIA. Receptacle convex. Achenia of the ray 3-sided and 3-awned, of the disk compressed, scarcely awned. Rays persistent.

Div. 1. HELIOPSIDEÆ, *DC.*—Rays pistillate and fertile (in Melanthera none), ligulate. Achenia never obcompressed (that is, flattened) parallel with the scales of the involucre or chaff of the receptacle; the exterior integument (calyx-tube) thick and firm, often separable from the interior. Pappus none, or coroniform, frequently toothed or with one or more rigid awns.

83. MELANTHERA. "*Rohr, in Kiob. nat. hist. selsk.* 2. (1792) *p.* 213";* *Cass., in jour. phys.* 1823, *DC. prodr.* 5. *p.* 544.

Melananthera, *Michx. &c.*

Heads discoid, many-flowered; the flowers all tubular and perfect. Scales of the involucre in a double series, nearly equal. Receptacle convex; the persistent chaff partly sheathing the flowers. Teeth of the corolla papillose. Branches of the style hispid above, acuminate. Achenia short, compressed-quadrangular, or sometimes triangular, truncate at the summit. Pappus of 2–18 rather rigid scabrous caducous bristles or awns.—Perennial herbaceous or rarely suffrutescent (American, tropical) scabrous plants, with quadrangular branching stems. Leaves opposite, or rarely ternately verticillate, petioled, triplinerved, toothed or serrate, often 3-lobed. Heads ternate or solitary, peduncled. Corolla white. Anthers black with whitish appendages.

1. *M. hastata* (Michx.): leaves opposite, very scabrous, mostly hastate-3-lobed; scales of the involucre lanceolate; chaff of the receptacle acuminate-cuspidate; awns of the pappus 2–3.—*DC.! prodr.* 5. *p.* 545. M. trilobata & panduræformis, *Cass. in dict. l. c.* 29, *p.* 485. Melananthera hastata, *Michx.! fl.* 2. *p.* 107; *Pursh! fl.* 2. *p.* 519; *Ell. sk.* 2. *p.* 315. Bidens nivea, *β.* & *γ. Linn.* (ex syn. *Dill. Elth. t.* 49 *f.* 47); *Walt. Car. p.* 201? Athanasia hastata, *Walt.! l. c.*

Dry soil, S. Carolina! to Florida! and Louisiana! (Also in Cuba, *La Sagra*, ex *DC.*) July–Sept.—Stem 4–6 feet high, often beautifully marbled or spotted. Leaves variable in form, between lanceolate and deltoid-ovate, either deeply or slightly hastate-3-lobed, or somewhat panduriform, sometimes undivided, acute or acuminate. Epigynous disk or nectary rather conspicuous, sheathing the base of the style.

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* *Transactions of the Natural History Society of Copenhagen.*

2. *M. deltoidea* (Michx.): leaves opposite, ovate-deltoid, undivided, or obscurely angulate-lobed, canescent-scabrous; scales of the involucre ovate; chaff of the receptacle somewhat membranaceous, obtuse, mucronulate.—*DC. l. c.* M. urticæfolia, *Cass.* Melananthera deltoidea, *Michx. l. c.* (note.) M. Linnæi, *H. B. & K.* Bidens nivea, *Linn. l. c.* (*a.* excl. syn. *Dill.*); *Swartz, obs. p.* 296. Calea aspera, *Jacq. ic. rar. t.* 583.

Key West, Florida, *Mr. Blodgett!*—A common species in the West Indies.

84. ZINNIA. *Linn.; Gærtn. fr. t.* 172; *Schkuhr, handb. t.* 252; *DC.*

Heads many-flowered; the ray-flowers pistillate; those of the disk tubular, perfect. Involucre imbricate; the scales roundish or oval, margined. Receptacle conical or somewhat cylindrical, covered with oblong conduplicate chaffy scales which envelope the disk-flowers. Rays obovate or oblong, coriaceous, reticulated, persistent, continuous with the summit of the achenium, or rarely somewhat articulated. Lobes of the corolla of the disk densely velvety-villous at the summit with colored hairs. Branches of the style in the disk-flowers terminated by a hairy somewhat capitate cone. Achenia nearly wingless; those of the ray somewhat 3-sided, mostly destitute of pappus; of the disk compressed or flat, 1–2-awned or toothed, rarely naked.—Annual (American) herbs, with opposite mostly sessile entire leaves. Heads solitary terminating the branches, showy, persistent. Rays purple, orange, scarlet, or greenish-white.

1. *Z. multiflora* (Linn.): stem erect, branching, somewhat hirsute; leaves scarcely somewhat petioled [or closely sessile] ovate-lanceolate; peduncles longer than the leaves; the apex (particularly of the central one) hollow and inflated or obconical, striate; scales of the campanulate involucre appressed; ligules obovate, obtuse or emarginate; chaff of the receptacle obtuse, entire; achenia of the disk with a single awn. *DC.*—*Linn. spec.* (*ed.* 2) 2. *p.* 1269; *Linn. f. dec. t.* 12; *Lam. ill. t.* 685; *Willd. spec.* 3. *p.* 2139; *DC.! prodr.* 5. *p.* 535.

Louisiana, *Willdenow.* Carolina, *Bosc!* Alabama, *Dr. Gates!* Key West, *Mr. Blodgett!* Texas, *Drummond!* Sept.—This is doubtless a native plant, at least in some of the above-cited localities. The specimens accord with the cultivated plant, in which also the leaves are often closely sessile, and the species is probably, as De Candolle suspects, not sufficiently distinct from Z. pauciflora, *Linn.* The rays are purplish in all our specimens, while in that of Bosc (in *herb. DC.*) they appear to have been yellow.

2. *Z. grandiflora* (Nutt.): perennial? dwarf; stem much branched from the base; leaves linear-lanceolate, connate, with scabrous margins; scales of the involucre rounded; rays (yellow) very large, orbicular-oval; paleæ fimbriate; achenia of the disk with a single awn. *Nutt. in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 348.

Rocky Mountains, *Dr. James!*—A very distinct and splendid species. Stem somewhat hirsute, scarcely more than 5 inches high. Leaves about an inch long, 2–3 lines wide. Rays three-fourths of an inch wide, appearing cordate at the base: disk apparently orange. *Nutt.*—The plant is minutely strigose, and the crowded leaves are impressed-punctate.

85. WYETHIA. *Nutt. in jour. acad. Philad.* 7. *p.* 39, *t.* 5, (1834), *& in trans. Amer. phil. soc. l. c.* (*n. ser.*) 7. *p.* 351.

Alarconia, *DC.* 1836.

Heads many-flowered; the ray-flowers numerous, pistillate, and sometimes with sterile filaments. Scales of the campanulate involucre loosely and irregularly imbricated in 2 or 3 series, somewhat equal, foliaceous, as long as the disk; the innermost smaller and resembling the chaff. Receptacle slightly convex; the chaff lanceolate, carinate, acute, as long as the flowers and partly embracing them. Rays large. Corolla of the disk cylindrical, elongated, with a short proper tube, 5-toothed; the teeth nearly glabrous. Branches of the style in the ray-flowers glabrous; in the disk elongated, linear-filiform, revolute, strongly hispid, nearly smooth on the back. Achenia stout, elongated, 4–5-angled, prismatic, terminated with a rigid coroniform or calyciform 5–10-toothed or laciniate pappus, one or more of the teeth usually prolonged into a rigid persistent awn.—Perennial herbs (natives of Oregon and California), with somewhat the habit of Helianthus or Inula Helenium, furnished with long tap-roots, usually simple stems, with alternate mostly entire veiny leaves, and large solitary heads. Flowers of the ray and disk yellow.

* *Scales of the involucre linear-lanceolate, numerous, more or less hirsute, as well as stem and leaves: rays* 12–20.

1. *W. helianthoides* (Nutt.): dwarf; stem very hairy at the summit, bearing a single head; leaves lanceolate, entire, somewhat pubescent, with scabrous margins, tapering into a petiole; exterior scales of the involucre linear, the interior lanceolate; pappus short, unequally and obtusely 5–10-toothed, and sometimes with a single slender awn.—*Nutt.! in jour. acad. l. c. t.* 5, *& in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 351.

"In the Kamas plains near the Flat-Head River, towards the sources of the Oregon, and in the plains near the Blue Mountains of Oregon," *Mr. Wyeth! Nuttall!*—About a span high. Rays pale yellow. Summit of the achenium and the variable coroniform pappus minutely pubescent.—We have not the means of satisfying ourselves whether this species is sufficiently distinct from the following.

2. *W. robusta* (Nutt.): stem and midrib of the leaves villous-hirsute, bearing a single head; cauline leaves lanceolate, acute, pubescent, entire, tapering to the base, the lower petioled; the radical large, elliptical-lanceolate, petioled, often sparingly serrate; scales of the involucre lanceolate, very hirsute, especially on the margins; pappus of 5–10 irregular stout teeth (silky-pubescent) and mostly of 1 to 4 stout awns.—*Nutt.! in trans. Amer. phil. soc. l. c.* Alarconia helenioides, *DC. prodr.* 5. *p.* 537? (and therefore Wyethia helenioides, *Nutt. l. c.?*)

β. leaves appearing somewhat glutinous; the lower elongated lanceolate, tapering into slender petioles.—Helianthus longifolius, *Hook.! fl. Bor.-Am.* 1. *p.* 312, *& bot. Beechey, suppl. p.* 353, as to the Oregon plant. H. Hookerianus, *DC. prodr.* 5. *p.* 590.

"Plains of the Oregon near the confluence of the Wahlamet, common, in wet places," *Nuttall!* *β.* "Common in low moist soil on the plains of the Columbia near the ocean, the plains of the Multnomah, and in the vallies of the Rocky Mountains," *Douglas!* in *herb. Hook.* June.—Stem stout, 1½–3

feet high, usually naked at the summit. Radical leaves a foot or more in length, 1 to 2½ inches wide.—In Mr. Nuttall's specimens, we observe traces of the clammy varnish which is so apparent on the leaves of the var. β.

* * *Scales of the involucre fewer, subspatulate-oblong: stem sometimes branching: rays seldom* 12.

3. *W. angustifolia* (Nutt.): stem hirsute or pubescent above; leaves spatulate-lanceolate, or the lower and radical spatulate-oblong, entire, nearly glabrous when old, attenuate at the base; the lowest petioled; scales of the involucre foliaceous, hirsute, especially on the margins; achenium hairy towards the truncate or obscurely coroniform summit, 1–2-awned, and often with a short sharp tooth from one or more of the remaining angles.—*Nutt.! l. c.* Alarconia angustifolia, *DC.! l. c.* Helianthus longifolius, *Hook. & Arn.! bot. Beechey, p.* 149.

California, *Beechey! Douglas! Nuttall!*—Stem varying from 8 to 20 inches in height, with a very large head, terminating the stem or branches. Lower leaves sometimes more than an inch broad, wider indeed in proportion to their length than in the preceding, often obtuse. Scales of the involucre an inch long, and a third of an inch broad.—We are uncertain whether the Alarconia helenioides of De Candolle is founded upon an awnless state of this, or the preceding species.

4. *W. amplexicaulis* (Nutt.): smooth and glabrous throughout, somewhat shining or glutinous; leaves lanceolate-elliptical, rather coriaceous, venose; the radical on short petioles, sometimes serrulate; the lower cauline narrowed at the base, nearly sessile; the upper partly clasping; heads solitary, or often two or more from the axils of the upper leaves, on short peduncles; scales of the involucre lanceolate-ovate or oblong, appressed, glabrous; pappus unequally 3–8-toothed, one or two of the teeth often prolonged into awns.—*Nutt.! l. c.* Espeletia amplexicaulis, *Nutt.! in jour. acad. Philad.* 7. *p.* 38.

In the Rocky Mountains, on Flat-Head River &c., *Mr. Wyeth! Nuttall!* June.—Root large and thick, used for food by the Indians. Stem 8 inches to 2 feet high. Lower leaves 6–12 inches long, 1–2 wide, often obtuse and somewhat obovate. Heads smaller than in the preceding; the broad scales of the involucre few, barely in a double series.

86. BALSAMORHIZA. *Hook. fl. Bor.-Am.* 1. *p.* 310; (under Heliopsis); *Nutt. in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 349

Heads many-flowered; the ray-flowers pistillate, in a single series; those of the disk tubular, perfect. Scales of the involucre imbricated in 2 to 3 or more series; the exterior foliaceous, as long as the disk; the innermost chaffy. Receptacle nearly flat; the chaff linear-lanceolate, acute, somewhat foliaceous, scarcely embracing the flowers. Corolla of the disk cylindrical, elongated, with a short proper tube, 5-toothed; the teeth sparingly bearded externally. Branches of the style in the disk-flowers filiform, very hispid throughout. Achenia quadrangular, or those of the ray compressed, glabrous, entirely destitute of pappus.—Low pubescent or canescent herbs (natives of the plains of Oregon and the Rocky Mountains); with a thick fusiform dark-colored root, abounding in a terebinthine juice, and chiefly radical leaves; the simple stems or scapes bearing usually solitary large heads, which resemble those of Helianthus. Ray and disk yellow.

The large roots of all the species, especially those of the second section, are employed by the Indians for food: when cooked upon hot stones, or otherwise, they acquire a sweet and rather agreeable taste. *Nuttall, &c.*

§ 1. *Leaves pinnatifid: scapes bearing a single head.*

1. *B. Hookeri* (Nutt.! l. c.): silky-pubescent or canescent; leaves with a lanceolate outline, pinnately parted; the segments very numerous, crowded, linear, sparingly toothed or incised, or the lower pinnatifid, and the uppermost confluent; scapes several from the same root; scales of the involucre narrowly lanceolate, acute, numerous, the exterior somewhat spreading. —Heliopsis? balsamorhiza, *Hook.! fl. Bor.-Am.* 1. *p.* 310.

β. leaves ovate-lanceolate, sinuate-pinnatifid and crenate-serrate.—Heliopsis (Balsamorhiza) terebinthacea, *Hook. l. c.?* (A state with the segments more or less confluent, which often occurs in a portion of the leaves.)

Plains of the Oregon, common, *Douglas! Nuttall!*—Stem at first 6–8 inches, in fruit 12–18 inches high, naked, or with one or two rudimentary or small pinnatifid leaves. Rays 12–18. Root exuding a copious limpid resin when wounded, with a strong turpentine odor.—By an error of the press, in Hooker's character, the scales of the involucre, instead of the radical leaves, are said to equal the stem in length: the latter is the case when the flowers appear; but in fruit the scape is much longer.

2. *B. hirsuta* (Nutt.! l. c.): somewhat hirsute, not canescent; leaves with an elongated lanceolate circumscription, pinnately divided; the divisions lanceolate-oblong or cuneiform, pinnatifid, often 2–3-parted, with rough hirsute-ciliate margins; petioles dilated and very woolly at the base; scales of the involucre broadly lanceolate, lanuginous-ciliate, closely imbricated in 4 or 5 series.

Dry plains near the Blue Mountains of Oregon, and in the Grande Ronde prairie, *Nuttall!*—Leaves about a foot long. Scape often entirely naked.

3. *B. incana* (Nutt.! l. c.): densely canescent-tomentose throughout; leaves with an oblong or deltoid-lanceolate circumscription, pinnately divided; the divisions oval or oblong, entire, or with the lower margin somewhat toothed, the uppermost confluent; scales of the involucre imbricated in 2–3 series; chaff of the receptacle much shorter than the flowers.

In the Rocky Mountains, *Nuttall!*—Scape 6–8 inches high, bearing a very showy head; the rays 12–14, more than an inch long, deep yellow, sometimes with infertile filaments, as also in the other species.

4. *B. macrophylla* (Nutt.! l. c.): nearly glabrous; leaves oblong or oval, pinnately parted; the divisions lanceolate-oblong, entire, sometimes slightly lobed or toothed at the base, with somewhat ciliate and scabrous margins; the uppermost confluent; scales of the involucre in about 3 series, lanceolate, the exterior foliaceous and reflexed.

Rocky Mountains, near the sources of the Colorado of the West, *Nuttall!* —Leaves and stem sprinkled with minute glandular atoms; the segments of the latter 2–3 inches long, sometimes nearly an inch wide.

§ 2. *Leaves entire or crenate, hastate-cordate, or the few cauline tapering at the base, all on long petioles: scapes bearing* 1 *to* 3 *heads: receptacle broad and flat.*—ARTORHIZA, Nutt. (Espeletia. *Nutt.*, not of *H. B. & K.*)

5. *B. sagittata* (Nutt.! l. c.): canescently tomentose; radical leaves cordate-hastate or cordate-ovate, entire, acute, somewhat 3-nerved at the base; the cauline linear, attenuate below; exterior scales of the involucre longer than the inner, spreading, lanceolate, densely tomentose; rays 20–24.—

Buphthalmum sagittatum, *Pursh, fl.* 2. *p.* 564, ex *Nutt.* Espeletia sagittata, *Nutt.! in jour. acad. Philad.* 7. *p.* 38, *t.* 4.

In the Rocky Mountains by Flat-Head River, &c., *Lewis, Mr. Wyeth!* —Head large and showy, 3 to 4 inches in diameter, while the scapoid stem is not more than a span high. *Nutt.*

6. *B. helianthoides* (Nutt.! l. c.): leaves densely tomentose-canescent; the radical on very long petioles, oblong, cordate-hastate, entire, acutish, the cauline lanceolate; scales of the tomentose involucre lanceolate, acuminate, appressed; rays about 15.—Espeletia helianthoides, *Nutt.! in jour acad. Philad. l. c.*

Rocky Mountains, with the preceding, (*Mr. Wyeth!*) to which it is very similar; but differs, according to Mr. Nuttall, in having a smaller and more imbricated involucre, &c. We should have taken this species for the Buphthalmum sagittatum of Pursh, except that that author states that the exterior scales of the involucre are longer than the disk.

7. *B. deltoidea* (Nutt.! l. c.): hirsute-pubescent; radical leaves on very long petioles, deltoid-cordate, acute, with undulate or crenate margins; the cauline 1–3, small, ovate or spatulate; involucre woolly or tomentose at the base; the scales in about 2 series; the exterior largest, linear-lanceolate, foliaceous, spreading, longer than the disk; rays 12–20.

Oregon, at Fort Vancouver, *Dr. Scouler!* and in wet open places on the Wahlamet, *Nuttall!* June.—Scapes a foot or more in height. Rays about an inch long.

87. HELIOPSIS. *Pers. syn.* 2. *p.* 473; *DC. prodr.* 5. *p.* 550, excl. § 3.

Heads many-flowered; the ray-flowers (10 or more) pistillate, in a single series; those of the disk tubular, perfect. Scales of the involucre in 2–3 series; the exterior foliaceous and somewhat spreading; the interior shorter than the disk. Receptacle conical; the lanceolate or linear chaff somewhat embracing the achenia. Branches of the style in the disk-flowers hairy towards the apex, which is obtuse and tipped with a mucronate appendage. Achenia glabrous, quadrangular, or in the ray 3-sided and convex externally. Pappus none, or rather an obsolete truncate crown.—Perennial (American) herbs, with rather large heads on long peduncles, terminating the stem or branches. Leaves opposite, petioled, triplinerved, serrate. Flowers yellow.

§ 1. *Rays articulated with the ovary, and at length deciduous: achenia smooth.*—EUHELIOPSIS, *DC.*

1. *H. lævis* (Pers.): nearly smooth and glabrous; leaves ovate-lanceolate or oblong-ovate, somewhat truncate at the base, or abruptly tapering into the petiole, coarsely serrate.—*Pursh! fl.* 2. *p.* 563; *Ell. sk.* 2. *p.* 407; *Darlingt.! fl. Cest. p.* 479: *Dunal! in mem. mus.* 5. *p.* 55; *Hook. bot. mag. t.* 3372; *DC.! l. c.* Buphthalmum helianthoides, *Linn.! hort. Ups.*, & *spec.* 2. *p.* 904: *Michx.! fl.* 2. *p.* 130; *L'Her. stirp. t.* 45; *Schkuhr, handb. t.* 257. Silphium helianthoides, *Linn.! spec.* 2. *p.* 920, ex syn. *Gronov.* Rudbeckia oppositifolia, (*Gronov.*) *Linn.! l. c.* Helianthus lævis, *Linn.! spec. ed.* 2., excl. syn. *Gronov.* Helepta parviflora, H. grandiflora, &c., *Raf.! neog.*

β. gracilis: much smaller in all its parts; stem very slender, minutely pubescent towards the summit; leaves lanceolate or ovate-lanceolate, acute at the base, scabrous.—H. lævis *β.*, *Hook.! compan. to bot. mag.* 1. *p.* 98. H. gracilis, *Nutt. in trans. Amer. phil. soc. l. c.*

γ. scabra: stem and oblong-ovate leaves scabrous; involucre pubescent or somewhat downy.—H. scabra, *Dunal! in mem. mus.* 5. *p.* 56, *t.* 4; *Hook. fl. Bor.-Am.* 1. *p.* 310.

Banks of streams, and in dry soil, throughout the United States! *β.* Louisiana, *Drummond*, *Dr. Hale!* Georgia, *Dr. Boykin!* Alabama, *Dr. Gates!* &c. *γ.* With the ordinary form, particularly in the Western States from Saskatchawan to Arkansas!—Stem 2–4 feet high; in var. *β.* 1–2 feet, and bearing usually a single head. Exterior scales of the involucre extremely variable; sometimes scarcely longer than the innermost, and with very short foliaceous tips; but often more spreading, almost entirely foliaceous, and even slightly serrate at the apex, as long as or longer than the disk. Peduncle thickened and obconical at the summit. Rays an inch or more in length, bright light yellow.—The original Helianthus lævis (H. foliis lanceolatis serratis lævibus, *Gronov. fl. Virg.*) is Bidens chrysanthemoides. Hence it were to be wished that Persoon had taken the specific name from some other of the numerous Linnæan synonyms. We have so many forms intermediate between H. lævis, H. scabra, and the very slender var. gracilis, that we unite them without the slightest hesitation; although the extremes appear abundantly different.

88. TETRAGONOTHECA. *Dill. Elth. p.* 378, *t.* 283; *Linn.*; *DC. prodr.* 5. *p.* 552.

Heads many-flowered; the ray-flowers (6–9) pistillate; those of the disk tubular, perfect. Involucre double; the exterior composed of 4 large and broadly ovate foliaceous acuminate scales, united towards the base into a 4-angled or 4-winged cup, valvate and reduplicate in æstivation: the interior of about 8 very small oval-lanceolate scales, resembling the chaff of the receptacle, partly clasping the achenia of the ray. Receptacle convex-conical; the chaffy scales membranaceous, lanceolate, acuminate, nerved. Corolla hairy at the base; the ray with a manifest tube; the ligules large and broad, coarsely about 3-toothed at the apex, many-nerved; of the disk deeply 5-toothed (10- or mostly 15-nerved); the teeth erect, glabrous. Style, in the disk-flowers, bulbous at the base (above the annular epigynous disk); the branches linear, hispid, tipped with an acuminate appendage. Achenia obovoid, nearly terete, thick, smooth, flat at the summit, destitute of pappus.—A perennial herb, somewhat viscidly hairy, and sprinkled with minute resinous globules. Leaves opposite, coarsely toothed, oval or ovate-oblong, narrowed at the base, closely sessile, and often slightly connate. Heads large, pedunculate, terminating the branches. Flowers pale yellow.

T. helianthoides (Linn.!)—*Willd. spec.* 3. *p.* 2116; *L'Her. stirp. p.* 177; *Pursh, fl.* 2. *p.* 563; *Ell. sk.* 2. *p.* 407; *DC. l. c.* Polymnia Tetragonotheca, *Linn.! syst. p.* 658; *Abbot, insects of Georgia*, 2. *t.* 69; *Schkuhr, handb. t.* 263. Silphium Tetragonotheca, *Gærtn. fr. t.* 171.

Dry sandy soil, Virginia! to Florida! and Alabama! May–June, often flowering again in Sept.—Root thick. Stem 2–3 feet high, terete. Leaves 3–6 inches in length, feather-veined, sometimes also triplinerved, either re-

pandly and unequally toothed, or with coarse and sharp salient teeth. Involucre, when expanded, two inches or more in diameter. Corolla of the disk with the proper tube short (the stamens inserted near the base), somewhat coriaceous, hairy externally (as also the summit of the ovary); the throat nearly cylindrical; the teeth ovate-lanceolate.—There are more commonly 10 nerves in the disk-corolla, approximate in pairs and nearly correspondent to the sinuses, near which they diverge, one traversing each lacinia as near to the axis as to the margin, and uniting within the apex with its fellow of the adjacent sinus, in the ordinary manner. Very frequently there are 3 nerves to each set, the middle one exactly corresponding to the sinus, but often vanishing or confluent with one of the lateral, in some part of its course: there are no nerves corresponding with the axis of the laciniæ as in Helianthus. The rays present 10 nerves, or by bifurcation 12 to 14.

89. HALEA.

Heads many-flowered; the ray-flowers (10–12) pistillate; those of the disk tubular, perfect. Involucre double; the exterior of 4 or 5 ovate foliaceous scales, united below the middle, valvate in æstivation, at length shorter than the disk; the interior of numerous (about 15) obovate or oval-lanceolate acuminate erect chaffy scales, more or less imbricated, nearly flat, many-nerved, similar to the chaff of the large conical receptacle. Corolla glabrous or nearly so; the rays broadly oval, slightly 3-toothed, tapering and involute at the base, but not tubular; of the disk deeply 5-toothed, 10-nerved. Style as in Tetragonotheca. Achenia 4-sided, pubescent, with a broad and flat summit, crowned with a short pappus, composed of about 20 thick and oval distinct and entire scales.—A tall and stout branching perennial herb, somewhat pubescent when young, with much the aspect and foliage of Tetragonotheca. Stem striate, quadrangular below. Leaves opposite, or rarely ternately verticillate, rather large, veiny, the margin thickly set with sharp unequal salient or laciniate teeth, all sessile; the lowermost oval-oblong, tapering into a narrowed base, more or less connate; the upper ovate or ovate-oblong, connate-perfoliate. Heads (rather large) on naked peduncles terminating the stem or branches. Flowers yellow.

H. Ludoviciana.

Dry sandy soil, Western Louisiana, *Dr. Leavenworth! Dr. Hale!* Texas, *Drummond! Dr. Leavenworth!* June–Aug.—Stem 2–4 feet high. Heads about an inch in diameter. Exterior involucre very slightly angled at the junction of the scales; which are broadly ovate, obtuse, or scarcely acuminate, glabrous, persistent, and at length shorter than the elongated conic receptacle. Rays not twice the length of the involucre, 10-nerved. Corolla of the disk with a very short coriaceous proper tube (as in Tetragonotheca), the elongated throat slightly dilated: the 10 nerves in pairs corresponding with the sinuses, approximate but distinct from the base to near the sinuses, where they diverge and traverse the lobes of the corolla about half way between the margins and the axis. Anthers yellowish. Exterior envelope of the achenium (calyx-tube) separable. Pappus a very short chaffy crown; the scales distinct but very thickly set, obtuse, nerveless, of nearly the same texture as in Sclerolepis; the alternate ones usually smaller and almost forming an exterior series.—If the pappus alone were considered, this plant

would probably be referred to the division Galinsogeæ of the subtribe Heleniеæ; but its true affinity is undoubtedly with the present subtribe, and particularly with Tetragonotheca. It forms, however, a distinct and very remarkable genus, which we have named in honor of one of its discoverers, Dr. Josiah Hale of Alexandria, Western Lousiana, a zealous botanist, who has favored us with extensive collections and important observations, illustrative of the botany of that region.

Div. 2. EUHELIANTHEÆ.—Rays (neutral or imperfectly styliferous) sterile, ligulate. Achenia often compressed, but never obcompressed. Pappus coroniform, toothed, or of 1–4 awns, chaffy scales, or squamellæ, often none. (Rudbeckieæ & a part of Coreopsideæ, *DC.*)

90. ECHINACEA. *Mœnch, meth. p.* 591; *Cass. dict.; DC. prodr.* 5. *p.* 554.

Heads many-flowered; the ray-flowers much elongated, in a single series, somewhat styliferous but sterile; those of the disk tubular, perfect. Scales of the involucre lanceolate, ciliate, often squarrose, imbricated in 3 or more series. Receptacle conical; the navicular lanceolate chaff terminated with a cartilaginous cusp, exceeding the flowers of the disk. Corolla of the disk cylindrical, with 5 erect teeth; the proper tube almost none; the stamens therefore inserted at the very base of the corolla. Branches of the style terminated with a long lanceolate hispid appendage. Achenia of the ray abortive; of the disk 4-sided, obpyramidal, thick. Pappus coroniform, unequally toothed, marcescent or persistent.—Perennial (N. American & Mexican) herbs; with alternate, or rarely opposite, 3–5-nerved undivided leaves. Stem or branches naked above and terminated by a single large head. Rays purple, or sometimes nearly white, 2–3-toothed at the apex, at length elongated and dependent, marcescent or tardily deciduous: disk-flowers greenish or dark purple; the points of the chaff purplish.

The propriety of separating these plants from Rudbeckia was suggested by Gronovius, in 1762, and recently by Elliott, who was not aware of its establishment by Mœnch in 1794.—The long and thick blackish roots are very pungent to the taste, and are employed in popular medicine, and for the cure of ulcers, in some parts of the country, under the names of *Lobelia*, *Black Sampson*, *&c.*—The disk in all the species is at first flattish, but elevated and between globose and conical in fruit: the marcescent rays also vary in length with age, as well as in color.

1. *E. purpurea* (Mœnch): stem smooth and glabrous, striate; leaves usually scabrous, often serrate; the radical ones ovate, about 5-nerved and veiny, on long petioles; the cauline ovate-oblong or ovate-lanceolate, tapering into a margined petiole, or the uppermost almost sessile; scales of the involucre imbricated in 3–5 series, squarrose.—*Mœnch, l. c.; DC.! l. c.* Rudbeckia purpurea, *Linn.! spec.* 2. *p.* 907; *Bot. mag. t.* 2; *Schkuhr, handb. t.* 259; *Michx.! fl.* 2. *p.* 143; *Pursh! fl.* 2. *p.* 573; *Nutt. gen.* 2. *p.* 178; *Ell. sk.* 2. *p.* 450; *Bart. fl. Amer. Sept.* 2. *t.* 64. Chrysanthemum Americanum, &c., *Catesb. Car.* 2. *t.* 59. Helichroa Linnæana, elatior, amœna, furcata, &c. *Raf. neog. &c.*

β. stem glabrous or slightly hispid near the summit; leaves hispid-scabrous, the upper ones sometimes opposite.

γ. stem and leaves hispid or hispidly scabrous; rays usually shorter and rather broader.—E. serotina, *DC.! l. c.* Rudbeckia purpurea β. serotina, *Nutt.! l. c.* R. serotina, *Sweet, Brit. fl. gard. t.* 4 ; *Lodd, bot. cat. t.* 1539. R. hispida, *Hoffm.*, ex *DC.* R. speciosa, *Link. enum.* 2. *p.* 352, ex *DC.*

δ. stem and leaves hispid-scabrous; rays nearly white.

Virginia! to Georgia! and Alabama! mostly in the Western districts, and Ohio! to Louisiana! δ. Illinois, *Dr. S. B. Mead!* July–Oct.—Stem 2–5 feet high. Rays 12–20, 1½ to more than 2 inches long, dull purple.—The short pappus appears to be persistent, not deciduous as described by De Candolle. The horizontal root, which is said to distinguish E. serotina, is sometimes observed in the smooth plant.

2. *E. angustifolia* (DC. l. c.) : stem hispid, mostly simple, naked above; leaves all lanceolate and linear-lanceolate, hairy or strigose-hispid, entire, 3-nerved, all but the uppermost tapering into petioles; scales of the short involucre in about 2 series.—E. pallida, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 354 (1841). Rudbeckia pallida, *Nutt.! in jour. acad. Philad.* 7. *p.* 77. (Rays 12–15, at first often short, at length elongated and slender, 2 inches long, dependent, varying from light purple to pale rose-color.)

β. leaves crowded towards the base of the short stout stem, oblong-lanceolate, on short petioles, strongly strigose-hispid ; rays 20 or more, pale rose-color or white.

γ. leaves hirsute; the lowest lanceolate-oblong, the upper narrowly lanceolate ; stem often glabrous below; rays about 15, dark red.—E. sanguinea, *Nutt.! in trans. Amer. phil. soc. l. c.* (Varies with the leaves almost glabrous.)

Prairies and low barrens, from Illinois! and Missouri! to Alabama! Arkansas! Western Louisiana! and Texas! β. Upper Missouri, *Mr. Nicollet!* May–July.—A common plant beyond the Mississippi, variable in size (1–3 feet high), usually slender, and nearly naked above the middle; the leaves 3–7 inches long, one-fourth to more than half an inch wide, on petioles of variable length. Heads smaller than in the preceding; the disk purplish-brown and usually with shorter cusps to the chaff. Root perpendicular.

3. *E.? atrorubens* (Nutt. l. c.) : glabrous; stem elongated, terete; leaves narrowly linear-lanceolate, entire, tapering into long petioles, the margins scabrous; chaff exserted, lanceolate, acute; rays very dark red. *Nutt.*—Rudbeckia atrorubens, *Nutt. in jour. acad. Philad.* 7. *p.* 80.

β.*? graminifolia:* stem slender, striate-angled, strigose-pubescent above; leaves scattered, narrowly linear, elongated, rigid, shining, slightly strigose-pubescent when young, 3-nerved (the lateral nerves marginal), acute, sessile; the lower with a long attenuate base as if petioled; rays 9 or 10, oblong, dark red-purple; chaff of the receptacle oblong, thick and fleshy, abruptly mucronate, as long as the (purple) corolla; pappus minute, 4-toothed.

Plains of Arkansas, and also in Georgia (*Dr. Wray*), *Nuttall.* β. Low pine barrens, Middle Florida, *Dr. Chapman!*—Mr. Nuttall speaks of his Rudbeckia atrorubens as "closely allied to R. purpurea and R. pallida, but perfectly distinct in its singular smoothness, very narrow entire leaves, and dark red rays, which are very showy from the intensity of their color; and in his recent memoir he accordingly refers it to Echinacea. Our plant agrees in many respects with his brief description; but has apparently still more attenuated leaves (2–3 lines wide, the lower a foot long), short rays (half an inch long), a strigose-hairy involucre, short cusps to the chaff, and short conical appendages to the style; so that it is a somewhat doubtful member of the genus. We have not seen it fully in flower; but suspect that the scarcely developed corolla (which is that of Echinacea) nearly equals the chaff in length.

91. RUDBECKIA. *Linn.* (*excl. spec.*); *Gærtn. fr. t.* 172; *Cass.*; *DC.*

Heads many-flowered; the ray-flowers neutral, in a single series; those of the disk tubular, perfect. Scales of the involucre foliaceous, in about 2 series, spreading. Receptacle conical or often more or less elongated and spiciform; the chaff concave or navicular. Corolla with a cylindraceous or somewhat dilated throat; the teeth erect or spreading. Branches of the style terminated by a very short obtuse cone, or rarely with a subulate-lanceolate barbellate appendage. Achenium quadrangular, obpyramidal or prismatic, glabrous, flat at the summit. Pappus none, or minute and coroniform, rarely somewhat conspicuous.—Mostly perennial (North American) herbs, with alternate leaves, and rather large and showy heads terminating the stem or branches. Rays yellow (rarely particolored), usually elongated, spreading or drooping. Corolla of the disk, and the style, purple or brownish-purple, sometimes greenish-yellow. Anthers fuscous.

§ 1. *Disk conical or subglobose: pappus very short and coroniform, or often none.*—RUDBECKIA proper. (Centrocarpha, *Don*, partly.)

* *Disk dark purplish-brown, subglobose or broadly conical: appendages of the style lanceolate or broadly subulate.*

1. *R. bicolor* (Nutt.): annual, hirsute; stem mostly simple, naked at the summit; leaves oblong, sessile, obscurely serrate, rather obtuse; the lowermost petioled; head (rather small) solitary; scales of the involucre linear-oblong, hispid, rather shorter than the oblong (yellow and brownish-purple) particolored rays; disk conical; chaff of the receptacle rather acute, hirsute at the summit, as long as the corolla; pappus none.—*Nutt.! in jour. acad. Philad.* 7. *p.* 81.

Arkansas and on Red River, *Nuttall!* Texas, *Drummond!*—Stem 1–2 feet high. Rays about 10, half an inch long; the lower half "intense blackish brown, with the gloss of velvet" (*Nutt.*) or dark purple; the upper part yellow. Branches of the style lanceolate, barbellate.

2. *R. hirta* (Linn.): very hirsute or hispid throughout; stems simple or slightly branched, naked at the summit; radical and lowest cauline leaves spatulate-oval or oblong, triplinerved, denticulate, petioled; the upper ovate-oblong or lanceolate, sessile, denticulate or serrate; scales of the involucre numerous, narrowly lanceolate; rays (about 14) spreading; disk broadly conical; chaff of the receptacle linear, mostly acute, hairy at the summit, about the length of the corolla; pappus obsolete.—*Linn.! spec.* 2. *p.* 907; *Michx.! fl.* 2. *p.* 143; *Pursh! l. c.*; *Brit. fl. gard.* 1. *t.* 82; *Ell. l. c.*; *Darlingt. fl. Cest. p.* 480; *DC.! prodr.* 5. *p.* 556. R. serotina, *Nutt.! in jour. acad. Philad.* 7. *p.* 80.

a. heads large; rays nearly twice the length of the involucre.—Obeliscotheca integrifolia &c., *Dill. Elth. t.* 218, *f.* 285.

β. heads smaller; rays scarcely exceeding the involucre; leaves mostly narrow.—R. strigosa *Nutt.! in trans. Amer. phil. soc. l. c.*

Dry soil, Upper Canada! and Western part of the State of New York! Michigan! &c. to Florida! Western Louisiana! and Texas! ② or 2↓? July–Sept.—Stem 1–2 or 3 feet high, very rough. Rays bright yellow,

1–1½ inch long; the disk dark purplish-brown. Pappus a minute margin. Appendages of the style lanceolate or linear-subulate.

* * *Disk dark purple or brown, subglobose or broadly conical: appendages of the style* ***very short and obtuse, or somewhat capitate.***

† Chaff glabrous and very dark purple at the summit, as well as the corolla.

3. *R. fulgida* (Ait.): stem hirsute or strigose-hispid, branching, the branches slender, naked at the summit; leaves strigose, sparingly denticulate; the cauline sessile, spatulate-oblong or oblong-lanceolate, narrowed towards the base, partly clasping, somewhat triplinerved; the radical ovate, petioled; scales of the involucre oblong or lanceolate, sometimes as long as the spreading oblong rays; chaff of the receptacle linear-oblong, obtuse or mucronulate, glabrous or slightly ciliate at the summit, rather shorter than the corolla; pappus coroniform, minute.—*Ait.! Kew.* (*ed.* 1) 3. *p.* 251; *Bot. mag. t.* 1996; *Willd. spec.* 3. *p.* 2248; *Ell. sk.* 2. *p.* 546; *Bart. fl. Amer. Sept.* 1. *t.* 54; *Darlingt. fl. Cest. p.* 480; *DC.! prodr.* 5. *p.* 556. R. chrysomela, *Michx.! fl.* 2. *p.* 143. R. aspera, *Pers.*; *Desf. cat.* R. spathulata, *Pursh, fl.* 2. *p.* 574.

β. slender; leaves narrowly spatulate-oblong or lanceolate; heads small; rays seldom exceeding the disk.—R. gracilis, *Nutt.! gen.* 2. *p.* 178, (& R. spathulata, *in herb. acad. Philad.*) R. discolor, *Ell. sk.* 2. *p.* 454. (In his note, instead of "to the preceding species," *to R. fulgida*, should doubtless be read.)

γ. slender; upper part of the stem and the leaves minutely strigose-pubescent; the latter spatulate, acute, mostly entire, much attenuate at the base, only the lowest somewhat clasping; involucre shorter than the rays.—R. spathulata, *Michx.! fl.* 2. *p.* 144; not of *Pursh*, nor of *Nutt. gen.*, ex spec. in *herb. Muhl.!* which appears to be Dracopis.

δ. stem stouter, often simple; leaves lanceolate or linear-lanceolate, mostly entire, clothed with loose or spreading (and at length somewhat deciduous) hirsute or hispid hairs. (Pubescence somewhat strigose; rays about the length of the involucre.—R. discolor, *Pursh! fl.* 2. *p.* 574.—Hairs often slender from a papillose base; heads large; rays exceeding the involucre.—R. discolor, *DC. l. c.*)

Dry soil, Pennsylvania to Georgia! and Florida! (*a.* & *β.*) *γ.* Mountains of Carolina, *Michaux!* Lincolnton, N. Carolina, *Mr. Curtis!* (a smoother dwarfish state of var. *a.* growing apparently in shade.) *δ.* Florida! to Western Louisiana! and Arkansas! Aug.–Oct.—Stem 1–3 feet high. Rays about 12, 2–3-cleft at the apex, deep orange-yellow, the lower surface and the base in dried specimens often reddish-orange.—Resembles R. hirta *in some of its forms*, and like that species variable in the size of its heads and rays; but generally distinguished by the short rays, the leaves more or less tapering below and dilated at the insertion, with a shorter pubescence, and always different in the very short and obtuse appendages of the style, and dark purple (instead of dull purplish-brown) disk.

4. *R. speciosa* (Wender): stem hirsute or hispid, loosely branched; the branches elongated, naked above; leaves roughish-hirsute or pubescent, coarsely and irregularly toothed or incised; the upper lanceolate, sessile; the lower ovate or ovate-lanceolate, acute or acuminate at both ends, petioled, triplinerved; the radical 5-nerved, on long petioles; scales of the involucre linear-lanceolate, unequal, about half the length of the numerous spreading elongated rays; chaff of the receptacle oblong-linear, mostly acute and glabrous, rather shorter than the corolla; pappus coroniform, minute.—"*Wender in flora* (1829), 1. *p.* 30"; *Schrad! in herb. DC.* 1832; *DC.! prodr.* 5. *p.* 556. R. fulgida, *Nutt.! herb.*; *Sullivant! cat. Ohio pl.* &c. (Varies, with

the upper leaves elongated lanceolate, closely sessile, with one or two large laciniate teeth or lobes on each side near the middle, the uppermost entire; as in the cultivated plant, and in specimens from the valley of the Susquehannah, Pennsylvania, *Dr. Sartwell!*; or with the upper leaves shorter and ovate-lanceolate or oblong, all but the uppermost narrowed at the base or petioled.)

Mountains of Pennsylvania! to Ohio, *Dr. Paddock! Mr. Sullivant! Mr. Lea!* where it appears to take the place of R. fulgida. Not uncommon in European gardens. Aug.–Oct.—This is a larger plant than R. fulgida, with showy heads terminating the long naked summit of the branches; the black-purple disk conoid-globose in fruit and two-thirds of an inch long; the oblong-linear rays bright yellow, an inch to an inch and a half long; the thin leaves 3 to 6 inches in length; the radical less toothed, and somewhat resembling those of the common Plantain.

5. *R. triloba* (Linn.): hirsute, paniculately branched; the branches spreading; cauline leaves sessile, more or less hairy; the uppermost ovate-lanceolate, slightly clasping, sparingly serrate or entire; the lower mostly 3-lobed, tapering at the base, coarsely serrate, acuminate; the radical on slender petioles, ovate or oval, obtuse, often subcordate, crenate-toothed, sometimes lobed or incised; heads (rather small) on short peduncles; scales of the involucre lanceolate-linear, unequal, usually shorter than the (mostly 8) oval or oblong spreading rays; chaff of the receptacle glabrous, lanceolate-oblong, cuspidate-awned, as long as the corolla: pappus coroniform, obsolete.—*Linn.! spec.* 2. *p.* 907; *Michx.! fl.* 2. *p.* 144 (excl. *β.*); *Ell. sk.* 2. *p.* 452; *Bot. reg. t.* 525; *Bart. fl. Amer. Sept.* 1. *t.* 24; *DC.! l. c.* R. triloba, subtomentosa (as to herb.), & aristata, *Pursh! fl.* 2. *p.* 575. Centrocarpha triloba (excl. syn. *Michx.*) & aristata, *Don, in Sweet. Brit. fl. gard. ser.* 2. under *t.* 87. Peramibus hirtus. *Raf.! in ann. nat.* (1820,) *p.* 14.

β. pinnatiloba: slender; earliest radical leaves roundish-oval (small), crenate, sometimes lobed; the others irregularly pinnatifid with the lobes short and obtuse: lower cauline leaves pinnately 5–7-lobed or parted; the upper 3-lobed or entire; heads small.—R. biennis, *Chapman! mss.*

Dry soil, Virginia! to Alabama! and Ohio! Illinois! &c., to Louisiana! *β.* Lime rocks, Middle Florida. *Dr. Chapman!* July–Sept.—Plant 3–5 feet high (probably biennial?), the conical receptacle exhaling a faint aromatic odor when divided. Disk black-purple, or dark chesnut, less than half an inch in diameter, at first depressed-globose, when old somewhat ovoid. Rays deep yellow, in dried specimens often orange towards the base, 6–12 lines long.—Well distinguished by the slender (dark-purple) cuspidate points of the chaff. In Pursh's character of R. aristata, the chaff of the *pappus* is said to be awned.

† † Chaff pale and often bearded or canescent at the summit, mostly shorter than the expanded corolla; the disk therefore at first fuscous, at length brownish or dull purple.

6. *R. subtomentosa* (Pursh): stem branching, tomentose-pubescent; leaves mostly petioled, hispid-scabrous above, soft and minutely tomentose beneath; the lower 3-parted or deeply 3-lobed: the upper mostly undivided, ovate or ovate-lanceolate, acuminate, serrate; heads somewhat corymbose; scales of the involucre numerous, narrowly lanceolate, canescent, imbricated, at length squarrose or reflexed, rather shorter than the subglobose brownish disk, many times shorter than the numerous spreading rays; chaff of the receptacle glandular-bearded at the obtuse (rather pale) summit, shorter than the corolla; pappus coroniform, obsolete.—*Pursh. fl.* 2. *p.* 575, ex char. & syn. (not of *herb.?*) R. triloba *β.* foliis subtomentosis, *Michx.! fl.* 2. *p.* 144. R. odorata, *Nutt.! in jour. acad. Philad.* 7. *p.* 78, not of the gardens.

Prairies and copses, (Mountains of Virginia?) Illinois! to Arkansas! Western Louisiana! and the borders of Texas! July–Aug.—Plant rather stout and with a coarse habit, 2–4 feet high; the receptacle when bruised, and perhaps also the leaves, exhaling an anisate or vanilla-like odor, much as in Lepachys. Leaves 3–5 inches in length; the lower ones sometimes undivided and the upper occasionally 3-lobed; but usually the lower ones only 3-parted or divided; the lateral lobes smallest, lanceolate; the terminal ovate-lanceolate or ovate, acuminate, serrate. Peduncles short. Rays, 10 to 12, or rarely 20, 10–15 lines long, bright yellow.

7. *R. mollis* (Ell.): stem hirsute-villous, branching; leaves sessile and partly clasping, oblong, obscurely serrate, tomentose-canescent on both sides, the lower ones somewhat spatulate: heads rather large; scales of the involucre numerous, linear-lanceolate, villous, reflexed about half the length of the rays; chaff linear, canescent at the summit, rather obtuse, as long as the purple corolla; achenia (small) minutely 4-toothed at the summit.—*Ell.! sk.* 2. *p.* 453; *DC.! prodr.* 5. *p.* 556. R. spathulata, *Pursh! fl.* 2. *p.* 574, not of *Michx.*

Western districts of Georgia, *Bartram! Baldwin! Elliott!* &c. Aug.–Oct.—Plant 2–3 feet high, canescent throughout; the branches simple and terminated by a single head. Leaves 12–15 lines long, soft. Rays 15–20, usually an inch long, pale yellow, but deep yellow at the base. Achenia scarcely half the length of the narrow chaff, exactly 4-sided; the angles produced into indistinct and minute obtuse teeth.

8. *R. Heliopsidis:* stem simple from a prostrate rhizoma, somewhat pubescent with appressed hairs, terete, bearing 3–6 slender angled branches or peduncles near the summit; leaves somewhat distant, ovate or oval, slightly serrate, mostly obtuse, quintuplinerved, glabrous or nearly so, abruptly contracted, the lower into long and slender, the upper into short petioles; scales of the involucre oblong or somewhat spatulate, minutely pubescent, at length squarrose, shorter than the subglobose brownish purple disk, and much shorter than the (10–12) oblong-linear spreading rays: chaff of the receptacle obtuse, canescent-pubescent at the summit, about the length of the corolla; achenia of the rays triangular and as large as the quadrangular fertile ones; pappus nearly obsolete.

α. almost glabrous; leaves more or less serrate, sometimes acute; involucre much shorter than the disk.

β. stem stouter, pubescent below with spreading, above with appressed hairs; leaves nearly entire, obtuse.

Pine woods, &c. *α.* Columbus, Georgia, *Dr. Boykin!* *β.* Cherokee country of Alabama, in wet places, *Mr. Buckley!* Aug.–Sept.—Stem about 2 feet high. Lower leaves 2–3 inches long, 1–2 broad, on petioles 2–6 inches long, which in *β.* are hairy, pale beneath, dull above. Rays scarcely an inch long, pale yellow, in *β.* presenting an abortive style. Involucre and disk exactly resembling some forms of Heliopsis lævis, except that the latter is brownish-purple: the achenia of the rays perfectly formed, and often larger than the fertile fruit, but not ovuliferous.

9. *R. alismæfolia:* glabrous; stem simple or sometimes branched, angled, smooth below, scabrous towards the long and naked striate-furrowed summit, terminated by large solitary heads; leaves (often membranaceous) somewhat scabrous, oval, obtuse or slightly pointed, entire or sparingly repand-toothed, 3–5-nerved and reticulate-veined; the radical and lower cauline tapering by a cuneate base into slender petioles; the uppermost cuneiform-obovate, nearly sessile; scales of the involucre linear, mostly shorter than the ovoid-globose brownish disk, and much shorter than the (12–15) drooping rays; chaff of the receptacle rather obtuse, canescent at the summit, a little shorter than the corolla; pappus coroniform, conspicuous, unequally crenate-toothed.

Plains and pine woods, Western Louisiana, especially on the borders of Texas, *Dr. Hale! Dr. Leavenworth! Dr. Carpenter!* Texas, *Drummond!* June–Aug.—Plant 2–3 feet high, rather slender. Lower leaves 3–6 inches long, 2–3 wide, usually nearly entire, strongly ribbed and beautifully reticulated between the ribs, sprinkled with minute resinous dots, sometimes membranaceous and nearly smooth; the upper all similar in form but smaller and on shorter petioles, or the uppermost sessile. Heads smaller than in R. grandiflora; the broadish rays an inch or more in length: the chaff, corolla, pappus, &c. very similar; the latter perhaps more conspicuous, as long as the proper tube of the corolla.—Closely allied to the following species.

10. *R. grandiflora* (Gmel., DC.): scabrous-hispid throughout; stem simple or branching, striate-angled; the branches naked above, and terminated by solitary (very large) heads; leaves rigid, very rough; the radical and lowest cauline ovate or oval, somewhat serrate or entire, 7-nerved and reticulate-veined, on long petioles; the upper lanceolate, unequally and sharply denticulate-serrate, acuminate at each end, 3–5-nerved, on short petioles, the uppermost sessile; scales of the involucre numerous, linear, shorter than the ovoid-globose purplish-brown disk, and many times shorter than the numerous (20 or more) drooping rays; chaff of the receptacle rather acute, somewhat canescent at the summit, shorter than the corolla; pappus coroniform, crenate or unequally toothed, conspicuous.—*DC. prodr.* 5. *p.* 556. R. nudicaulis, *Nutt. mss.*, not of *Pers.* Centrocarpha grandiflora, *Don, in Sweet, Brit. fl. gard. ser.* 2. *t.* 87.

Dry plains, &c., Red River, Arkansas, *Nuttall! Dr. Pitcher! Dr. Leavenworth!* July–Sept.—Stem stout, 2–3 feet high, thickly clothed, like the both surfaces of the leaves, with short and very rough hispid hairs. Leaves with strong nerves, or rather ribs, running from the base to the apex; the upper 4–6 inches long, an inch or less wide; the lowermost sometimes 8 inches long and 3–4 broad. Heads in the cultivated plant sometimes "nearly 6 inches across"; the rays in our indigenous specimens 2 inches long, golden yellow, minutely tomentose-pubescent beneath. Receptacle narrowly conical.—The character given by De Candolle, which is chiefly taken from that of Don, is incorrect in several particulars: the pappus is not very short, but large for a Rudbeckia; the rays are not hispid beneath, nor is the chaff pungent, or even pointed, in this, or in any of Prof. Don's species of Centrocarpha, except R. triloba.

* * * *Disk greenish-yellow, conical, somewhat prolonged when mature; the receptacle at length columnar or spiciform: chaff navicular, truncate, somewhat bearded at the summit, not longer than the prismatic achenia: branches of the style truncate, slightly thickened and bearded at the summit.*

11. *R. laciniata* (Linn.): glabrous; stem tall, branching; leaves minutely hairy and scabrous, particularly on the margins; the radical and lowermost pinnately (5–7-) divided, the divisions 3-lobed or incised, sometimes laciniate; upper leaves irregularly 3–5-parted, with the segments lanceolate or ovate-lanceolate, acuminate, often toothed, or incised; the uppermost simple, lanceolate or ovate, incisely toothed or entire; heads (rather large) somewhat corymbose-paniculate; rays drooping, about twice the length of the ovate-lanceolate scales of the involucre; achenia prismatic, with a coroniform toothed pappus.—*Linn.! hort. Cliff., & spec.* 2. *p.* 906; *Michx.! fl.* 2. *p.* 144; *Willd.! spec.* 3. *p.* 2247: *Pursh! fl.* 2. *p.* 575; *Ell. sk.* 2. *p.* 451; *Bart. fl. Amer. Sept.* 1. *t.* 16; *Darlingt. fl. Cest. p.* 481; *DC.! prodr.* 5. *p.* 555.

β. leaves glabrous, the upper ones undivided.—R. lævigata, *Pursh! fl.* 2. *p.* 574, not of *Nutt.*

γ. divisions of the radical and lower leaves pinnatifid.—R. digitata, *Mill.*

dict.; *Ait. Kew.* (*ed.* 1) 3. *p.* 251; *Willd.! enum.* 2. *p.* 921; *Pursh! l. c.*; *Ell. l. c.*; *DC.! l. c.* R. laciniata *β.* angustifolia, *Pers. syn.* 2. *p.* 476. R. lævis, *Hoffm.*, ex *DC.*

Moist thickets, Canada! to Alabama! Western Louisiana! and to near the sources of the Missouri! July–Sept.—Stem 4–8 (in *β.* 3–4) feet high. Rays bright light yellow, oblanceolate, 1–2 inches long. Radical leaves scabrous on both sides; the divisions and segments often long and very narrow, sometimes rhombic-ovate.—The var. *β.* is common in the mountains of North Carolina.

12. *R. heterophylla:* cinereous-pubescent; leaves minutely tomentose beneath, scabrous above; the lower petioled, pinnately 3–5-parted or divided, the oblong divisions sparingly toothed, the terminal one cuneiform and mostly 3-cleft; the upper simple, ovate, slightly petioled, strongly serrate, acute; heads somewhat corymbose; rays drooping; achenia prismatic, with a short coroniform denticulate pappus.

Middle Florida, *Dr. Chapman!*—Plant smaller in all its parts than R. laciniata, with the upper leaves evenly dentate-serrate throughout. Disk globose, and the receptacle conical, perhaps elongated when old. Chaff cuneiform-oblong, minutely canescent at the summit, slightly pointed. Pappus shorter than in R. laciniata.

§ 2. *Scales of the involucre few; the exterior spreading, the innermost erect, similar to the chaff of the spiciform elongated receptacle: the disk at length columnar: rays with abortive achenia: branches of the style terminated by a very short and obtuse cone: achenia of the disk as long as the obtuse chaff, acutely 4-sided; the pappus continuous with its summit, sheathing the lower portion of the corolla, irregularly toothed or lacerate-denticulate; that of the ray small with a short coroniform pappus.*—MACROCLINE.

13. *R. maxima* (Nutt.): very smooth and glabrous throughout, somewhat glaucous; leaves large, membranaceous, broadly oval or ovate-oblong, crenate-denticulate or entire, feather-veined and reticulated, the radical and lower cauline petioled; the upper clasping, either tapering at the base or cordate; head usually solitary on a long peduncle; rays large, drooping; chaff pubescent at the summit.—*Nutt.! in trans. Amer. phil. soc. l. c. p.* 354.

Plains of Red River, *Nuttall!* Moist pine woods and along shady streams, Western Louisiana, Arkansas, and Texas, *Dr. Leavenworth!* and near Alexandria, Louisiana, *Dr. Hale!* June–Aug.—Stems 4–9 feet high, "growing in extensive masses" (*Nutt.*), stout, striate. Leaves 8–10 or 12 inches long, and 4–5 broad, "but little inferior in size to those of the Cabbage" (*Nutt.*), obtuse or slightly acuminate; the numerous veins diverging from the strong midrib, reticulated, the upper ones usually converging to the apex. Rays 10–15, usually 2 inches in length, oblong-linear, bright yellow, much longer than the linear scales of the involucre. Disk fuscous, at length frequently 1½ to 2 inches in length, and columnar, 9 to 10 lines in diameter; the receptacle a narrow cylindrical and pointed rachis. Corolla of the disk brownish-purple; the teeth erect. Style with a large bulb at the base. Achenia 3 lines long, usually somewhat compressed; the pappus perfectly continuous with the summit of the achenium and of the same texture, becoming scarious at the summit, sometimes nearly half as long as the immature achenium itself and including the lower half of the corolla, but often shorter.—This and the following species might be considered as a separate genus with nearly the same reason as Dracopis, which they closely resemble in their receptacle, involucre, &c.: but as to the pappus they do not greatly

differ from Rudbeckia alismæfolia; and R. laciniata has a similar, although less elongated receptacle.

14. *R. nitida* (Nutt.): very smooth and somewhat shining; stem simple or sparingly branched above; leaves coriaceous, oval-oblong and lanceolate, nervose and reticulated, repand-denticulate or entire, mostly acute at each end; the radical and lower cauline tapering into slender usually margined petioles, the uppermost (often linear-lanceolate) partly clasping; rays large, drooping; chaff pubescent at the summit.—*Nutt.! in jour. acad. Philad.* 7. *p.* 78. (1834.) R. glabra, *DC. prodr.* 5. *p.* 556?

Georgia and Florida, on the borders of swampy open thickets, *Nuttall!* Prairies, Louisiana, *Dr. Leavenworth! Dr. Carpenter! Dr. Hale!* Texas, *Drummond!* June–July.—Plant 3–5 feet high, much resembling the preceding, but with more nervose smaller leaves (the lower 4–6 inches long, 1–3 wide), beautifully reticulated between the nerves or ribs, &c. Stem either simple, with a solitary head on a long naked peduncle, or branched above, producing several heads. Heads nearly as large as in the preceding, with 8–12 rays; the disk sometimes broadly conical and apparently unchanged in fruit; but commonly elongated like the preceding, and sometimes attaining the length of 2 inches.—Both these species would be very showy in cultivation.

§ 3. *Involucre and chaff as in* Macrocline: *rays none! (always?): corolla of the conical-oblong disk nearly destitute of proper tube (the stamens inserted into the very base): branches of the style slightly dilated upwards, truncate-capitate: achenia prismatic: pappus coroniform and somewhat toothed, nearly as in* R. laciniata.—ACOSMIA, Nutt.

15. *R. occidentalis* (Nutt.): smooth and glabrous; stem stout; leaves ovate-lanceolate, acuminate, entire or repandly toothed, sometimes irregularly lobed, scabrous on the margin, 3-nerved; the uppermost sessile, lanceolate, entire; heads few, on long peduncles; disk conical; scales of the involucre lanceolate, acuminate, nearly in a single series. *Nutt.! in trans. Amer. phil. soc. (n. ser.)* 7. *p.* 355.

Rocky Mountains, and woods of Oregon, particularly in the Blue Mountain range, by small streams, *Nuttall!*—Plant about 3 feet high. Leaves ample, somewhat reticulated as in the preceding. Disk purplish-brown, probably elongated in fruit.—Apparently the only species west of the Rocky Mountains.

R. asperrima, Hornem. (*Loud. hort. Brit.*)

R. cicutæfolia, Spreng. is founded on Heliopthalmum cicutæfolium, *Raf. fl. Ludov.*

92. LEPACHYS. *Raf. in jour. phys.* 1819, *p.* 100; *Less. syn. p.* 225.

Lepachys & Ratibida, *Raf. l. c.*—Obeliscaria, *Cass.* (1825), *DC.*

Heads many-flowered; the ray-flowers few, in a single series, neutral; those of the disk small, tubular, perfect. Scales of the involucre few, linear or subulate, spreading, or sometimes with an inner series of small obtuse scales similar to the chaff of the receptacle. Receptacle elongated, columnar or spiciform; the chaff truncate or obtuse, thickened and bearded or villous at the summit, nearly the length of the disk-flowers and partly enclosing or embracing the achenia. Corolla of the disk short, cylindrical, with 5 short

recurved teeth; the proper tube none; the stamens therefore inserted into the very base of the corolla. Achenia of the ray 3-angled, hairy, abortive; of the disk compressed, glabrous or ciliate, with a wing-like margin on one or both sides, which is more or less produced into a tooth at the summit; the areola at the base somewhat lateral.—Perennial usually branching strigose-scabrous herbs (natives of North America, chiefly of the region between the Mississippi and the Rocky Mountains); the striate-sulcate stems or branches naked above, and terminated by single showy heads. **Leaves alternate, pinnately parted or divided**; the divisions narrow, sometimes again pinnatifid. **Rays spreading or drooping**, yellow, sometimes partly or entirely orange-brown. Disk cylindrical, exhaling a fragrant anisate odor when bruised, the apex of the chaff canescent; the corolla, anthers, and branches of the style fuscous.

De Candolle, who has by mistake given the year 1829, instead of 1819, as the date of Rafinesque's memoir (which is however elsewhere correctly cited), has thence adopted Cassini's name of Obeliscaria, doubtless upon the supposition of its priority. Cassini passed by Rafinesque's name, because, as he states, he could not ascertain what plant that author had in view: the character is certainly not altogether correct; but Rafinesque mentioned Rudbeckia pinnata as the type of his genus. We feel obliged, therefore, to follow Lessing, and retain the name of Lepachys for this genus; which, although well marked in habit and character, must be divided into as many sections or subgenera as there are species. L. pinnata approaches nearest to the original Rudbeckia, viz: R. laciniata.

§ 1. *Achenia quadrangular-compressed; the inner margin very obscurely winged, the summit obsoletely and obtusely 2-toothed, naked: appendages of the style lanceolate, acute, barbellate-hispid.*—OBELISCARIA, Cass. (Lepachys, *Raf.*)

1. *L. pinnata:* scabrous and pubescent with minute strigose hairs; leaves pinnately divided; the divisions 3–7, lanceolate, acute or acuminate at each end, sparingly serrate-toothed or entire; the uppermost undivided; disk oval-oblong, much shorter than the rays.—L. pinnatifida & angustifolia, *Raf.! l. c.* Rudbeckia pinnata, *Vent.! hort. Cels. t.* 71; *Michx.! fl.* 2. *p.* 144; *Smith, exot. bot.* 1. *t.* 38; *Bot. mag. t.* 2310; *Willd.! enum.* 2. *p.* 921; *Pursh! fl.* 2. *p.* 576. R. digitata, *Willd.! spec.* 3. *p.* 2247, excl. syn. *Moris. & Ait.* R. tomentosa, *Ell.! sk.* 2. *p.* 453, excl. syn. R. odorata & cinerea, of the gardens. Obeliscaria pinnata, *Cass. in dict. sci. nat.* 46. *p.* 401; *DC.! prodr.* 5. *p.* 558.

Dry prairies and plains, from Western New York (*Dr. Sartwell!*) and Pennsylvania (*Muhlenberg!*) Iowa! and Michigan! and throughout the Western States to Louisiana! the western part of Georgia (*Baldwin! Elliott!*) Alabama (*Mr. Buckley!*) and Middle Florida, *Dr. Chapman!* June–Sept.—Plant 3–4 feet high. Divisions of the leaves varying from oblong-lanceolate and coarsely toothed, to narrowly lanceolate-linear and entire; the terminal & superior divisions largest, often confluent. Rays bright yellow, 1½ to 2½ inches long, varying from 3 or 4 to 8 or 9 lines in breadth. Chaff 3-nerved; the lateral nerves colored. Achenia when young exhibiting a narrow indistinct wing on each margin, which is slightly produced beyond the summit, so that the achenium is obscurely 2-toothed.

§ 2. *Achenia much compressed; the inner margin evidently winged and slightly ciliate; the summit somewhat* 1–2-*toothed, and crowned with an ob-*

scure lacerate fringe: branches of the style flattish, terminated by a very short truncate or obscurely conical barbellate appendage.—RATIBIDA, Raf., Don. (Obeliscaria § Ratibida & Monodonta, *DC.*)

2. *L. columnaris:* strigose-scabrous, mostly branched from the base; radical (primordial) leaves undivided, spatulate-lanceolate; the cauline pinnately parted, the upper sessile; segments linear-lanceolate or oblong, rigid, mucronulate, entire, rarely somewhat lobed; disk columnar, in fruit longer than the 5–8 oblong or obovate-oval recurved yellow rays.—Rudbeckia columnaris, *Pursh! fl.* 2. *p.* 575; *Bot. mag. t.* 1601; *Nutt.! gen.* 2. *p.* 178; *Hook.! fl. Bor.-Am.* 1. *p.* 311. R. columnifera, *Nutt. in Fras. cat.* Ratibida sulcata, *Raf. in jour. phys. l. c.* R. columnaris, *Don, in Brit. fl. gard. ser.* 2. *no.* 361. Obeliscaria columnaris, *DC.! prodr.* 5. *p.* 559.

β. pulcherrima (Don): rays wholly or in part brown-red.—Varies, like var. *a.* with the segments somewhat oblong or narrowly linear-lanceolate, either entire (*Don, in Brit. fl. gard. l. c. t.* 361); or the narrowly linear divisions of the leaves again irregularly pinnatifid, the rays also yellow at the apex (Obeliscaria pulcherrima, *DC.! l. c.*); or the rays entirely brown-red, with the columnar disk variable in length (Rudbeckia Tagetes, *James! in Long's exped.* 2. *p.* 68. Obeliscaria Tagetes, *DC. l. c.*), occasionally subglobose, the peduncles shorter. R. globosa, *Nutt.! in jour. acad. Philad.* 7. *p.* 19. R. columnaris, *Torr.! in ann. lyc. New York*, 2. *p.* 215.

Plains of the Upper Missouri, *Bradbury! Nuttall!* also between the Missouri and Mississippi, and on St. Peter's River, *Mr. Nicollet!* to Saskatchawan, *Drummond!* extending to the Rocky Mountains, *Douglas!* *β.* With the preceding, *Nuttall, Mr. Nicollet!* Upper Arkansas, *Dr. James!* to Texas, *Drummond!* and *Berlandier!* July–Aug.—Plant 10 inches to 2 feet high. Leaves crowded or somewhat distant; the segments variable: the rays an inch long, and sometimes nearly as broad. Chaff with woolly tips and mostly ciliate on the margins, near which is an oblong purple spot. Wing of the achenia (anterior) terminated by a short acute membranaceous tooth, which is sometimes obsolete; the exterior margin obscurely if at all winged, but sometimes very slightly toothed at the summit.—The specimens collected in Mr. Nicollet's expedition entirely justify the union of the varieties with red-brown or particolored rays to the yellow R. columnaris. Both forms vary with the disk an inch or more in length, and in starved specimens reduced to half, or even one-third of an inch, when it is nearly globose. The specimens of Dr. James belong to a dwarf, much branched and leafy plant, with short peduncles.

§ 3. *Achenia much compressed, 2-winged and conspicuously 2-toothed or 2-awned (the summit and the teeth obscurely bearded): the wings strongly fimbriate-ciliate: branches of the style terminated by a lanceolate acute barbellate-hispid appendage.*—LOPHOCHÆNA.

3. *L. pedunculuris:* stem simple or branching near the base, leafy and hirsute below; leaves hirsute or strigose, bipinnately parted; the ultimate segments short, obtuse; peduncles naked, very long: disk columnar, twice or thrice the length of the rays; chaff sparsely ciliate, slightly bearded at the summit.

Texas, *Drummond!*—Root fusiform. The leafy portion of the stem 6–8 inches; the naked peduncle 12–16 inches in length. Radical leaves unequally pinnately divided; the divisions numerous, oblong or cuneiform, incised or pinnatifid; the upper leaves regularly pinnatifid, with narrow segments. Disk an inch and a half or more in length, cylindrical. Exterior

scales of the involucre very few, subulate; the interior much shorter, resembling the chaff of the receptacle. Rays linear-oblong, yellow. Chaff with a bright purple spot near each margin. Achenia (immature) flat, oval, 2-winged; the inner wing broader, and more conspicuously fringed with stout spreading bristles; the summit produced into 2 sharp slightly unequal teeth or awns, which are fully half the length of the corolla, and confluent with the wings, in the manner of Silphium.

93. DRACOPIS. *Cass. dict.* 35. *p.* 273; *DC. prodr.* 5. *p.* 558.

Heads many-flowered; the ray-flowers neutral, in a single series; those of the disk tubular, perfect. Scales of the involucre in 2 series; the exterior 6–8, small, linear, spreading; the interior very small, appressed, resembling the chaff of the receptacle. Receptacle cylindrical, pointed; the chaff linear, somewhat bearded at the summit, abruptly mucronulate, rather shorter than the flowers. Corolla of the disk with a manifest tube; the throat expanded, 5-toothed, the teeth reflexed. Branches of the style terminated by a linear-lanceolate barbellate appendage. Achenia terete, narrowed towards the base, with a lateral areola, minutely striate and granulated. Pappus obsolete (an extremely minute entire crown or border), or none.—An annual branching glabrous herb; the stem and branches striate-sulcate. Cauline leaves cordate-clasping, oblong or oval, mostly acute, entire, the lower ones serrate, smooth and pale, reticulate-veined; the margins ciliate-scabrous. Heads solitary, peduncled, terminating the branches. Rays yellow, often with an orange-brown spot at the base. Disk (at first somewhat conical, at length cylindrical) fuscous.

D. amplexicaulis (Cass. l. c.)—*Hook. bot. mag. t.* 3716, *& compan.* 1. *p.* 99. Rudbeckia amplexicaulis, *Vahl, in act. Hafn.* 2. *p.* 29, *t.* 4; *Schkuhr, handb.* 3. *t.* 259. R. amplexifolia, *Jacq. ic. rar.* 3. *t.* 592; *Willd.! spec.* 3. *p.* 2249; *Pursh! fl.* 2. *p.* 573. "R. perfoliata, *Cav. ic.* 3. *p.* 27, *t.* 252." R. spathulata, *Nutt. gen.* 2 *p.* 178, ex *Muhl. herb.!*

Low prairies, &c., Louisiana! Arkansas! and Texas! (Also in Mexico according to Cavanilles.) May–Aug.—Stem 1–3 feet high. Rays cuneiform-oblong, 2–3-toothed, 6–10 lines long. Disk at length about an inch long. Anthers fuscous. Branches of the style purple.

94. GYMNOPSIS. *DC. prodr.* 5. *p.* 561.

Gymnolomia, *H. B. & K.*—Aldama, *Lallav. & Lex.?*

Heads many-flowered; the ray-flowers in a single series, neutral; those of the disk tubular, perfect. Scales of the involucre in a double series, the exterior somewhat foliaceous. Receptacle flat or convex, or perhaps conical, chaffy. Branches of the style with long appendages. Achenia crowned with a very short coroniform-toothed pappus.—Herbaceous or somewhat shrubby (American) plants, with opposite petioled 3-nerved or triplinerved leaves. Heads pedunculate. *DC.*

1. *G. uniserialis* (Hook.): stem erect, scabrous, branching, somewhat dichotomous; leaves oblong-ovate, petioled, angulate-toothed, obsoletely

punctate and nearly naked above, strigose-hairy beneath; scales of the involucre oblong-spatulate, hirsute, in a single series; chaff of the receptac, leincluding the very glabrous and shining achenia, at length tuberculate and scabrous, tubular; pappus coroniform, fimbriate. *Hook.! ic. pl. t.* 145; *DC. prodr.* 7. (*mant.*) *p.* 289.

Texas, *Drummond!*—Plant strigose-hirsute; the stems apparently 2 feet or more in height. Leaves ovate-lanceolate; the uppermost alternate. Rays rather large, bright yellow, oblong. Disk-flowers about 30; the corolla (yellow) slightly dilated upwards, with 5 elongated and very narrowly linear lobes. Stamens inserted near the base of the corolla; anthers brownish, tipped with a slender lanceolate appendage. Appendages of the style very long, hirsute, filiform-linear. The edges of the chaffy scale which encloses each achenium at length cohere firmly.—Nearly allied apparently to G. dentata and G. Schiediana of De Candolle; but the genus seems to include incongruous plants.

95. ENCELIA. *Adans.*; *Cav. ic.* 1. *t.* 61; *DC. prodr.* 5. *p.* 566.

Heads many-flowered; the ray-flowers neutral, in a single series; those of the disk tubular, perfect. Involucre somewhat imbricated in 2–3 series, equalling the disk. Receptacle flat: the chaff membranaceous, navicular. Branches of the style terminated by a cone. Achenia compressed, flat, emarginate, destitute of pappus, with the margins densely woolly or villous. —Shrubby plants of the Pacific coast of America, more or less canescent; the leaves alternate, ovate or oblong, petioled, entire or nearly so. Heads few, terminating the paniculate branches. Ray and disk yellow.

1. *E. Californica* (Nutt.): erect, much branched; the branches puberulent-canescent; leaves lanceolate-ovate, acute, sometimes angular-toothed at the obtuse or rounded base, abruptly petioled, 3–7-nerved, nearly glabrous, the margins scabrous; involucre very villous; achenia nearly glabrous except the margins, which are very densely villous-hirsute.—*Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 357.

Dry hills, near St. Barbara [or St. Diego], *Nuttall!* April.—A low, rather showy, brittle shrub, with the scent of Calendula or Gaillardia.

96. VIGUIERA. *H. B. &. K. nov. gen. & spec.* 4. *p.* 224, *t.* 379; *DC. prodr.* 5. *p.* 578.

Heads many-flowered; the ray-flowers few, neutral; those of the disk perfect. Scales of the hemispherical involucre nearly in a single series, somewhat equal, with foliaceous tips or appendages. Receptacle either conical or flattish; the persistent chaff embracing the achenia. Appendages of the style subulate, hispid. Achenia obovate-cuneiform, pubescent. Pappus of 4 small denticulate squamellæ and 2 awns, deciduous.—Annual or perennial (W. Indian, Mexican, and Texan) herbs; with alternate or opposite leaves, and small heads with yellow rays.

Viguiera prostrata, *DC.* is not a North American plant; and is perhaps different from Helianthus prostratus, *Willd.*

1. *V. Texana:* stem hairy, sparingly branched; leaves alternate (the lowest opposite), rhomboid-ovate, acuminate, sparingly serrate, triplinerved, appressed-pubescent, somewhat scabrous above, abruptly contracted into long villous petioles; peduncles solitary or subcorymbose; scales of the involucre villous-canescent, in 1–2 series, with linear foliaceous appendages; chaff of the nearly flat receptacle membranaceous, ovate, cuspidate; rays 8–10; achenia appressed-pubescent.

Texas, *Drummond!*—Root and base of the stem unknown. Leaves 4–5 inches long, 2–3 broad, membranaceous; the lower petioles 2 inches in length. Appendages of the involucral scales longer than the ovate-oblong appressed portion; or those of the inner series, when present, shorter. Chaff scarious, with a short rigid cusp. Squamellæ of the pappus small, roundish, lacerate-fimbriate: awns rather shorter than the achenia, dilated and lacerate-denticulate near the base.—Apparently near V. laxa, *DC.*

97. HELIANTHUS. *Linn.; Schkuhr, handb. t.* 258; *Less. syn. p.* 229.

Helianthus & Harpalium, *Cass., DC.* excl. § Harpalizia?

Heads many-flowered; the ray-flowers several or numerous, neutral; those of the disk perfect. Involucre imbricated in 3 or more series; the scales with or without foliaceous tips or appendages. Receptacle flat or convex; the persistent chaff embracing the achenia. Corolla of the disk commonly 10-nerved, with a short proper tube. Branches of the style hispid, terminated by a subulate-conical appendage. Achenia 4-sided or mostly compressed, not winged or margined. Pappus of 2 chaffy scales or awns, arising from the principal angles of the achenia, and often with 2 or more smaller intermediate scales or squamellæ, very deciduous.—Annual or perennial (chiefly North American) mostly rough herbs; with opposite, sometimes alternate or scattered, commonly triplinerved leaves. Heads solitary or somewhat corymbose. Rays yellow; the corolla of the disk yellow, or sometimes dark-purple at the summit.—*Sunflower.*

The corolla of the disk in Helianthus is generally 10-nerved, the 5 additional or secondary nerves corresponding with the axis of the laciniæ: in H. mollis there are commonly 10 others, alternating with the former, but they seldom extend to the laciniæ. H. Radula, H. heterophyllus, & H. angustifolius, however, present the ordinary venation of Compositæ (viz. 5 nerves corresponding with the sinuses); and this is occasionally the case in H. longifolius. In H. Nuttallii, we observe a secondary or median nerve in two of the laciniæ only.

* *Annual: heads usually large: rays numerous: receptacle flat: involucre spreading: disk brownish-purple: leaves ovate or cordate, mostly alternate, triplinerved.*—Annui.

H. annuus, the common *Sunflower*, is very generally cultivated, but is no-where naturalized in this country.

1. *H. argophyllus:* densely lanate; leaves alternate, mostly entire: the lower cordate; the upper ovate, acute, on short petioles; heads axillary and terminal, on short peduncles; scales of involucre ovate, acuminate, woolly; achenia compressed, slightly hairy at the summit; pappus of 2 very deciduous chaffy awns.

Texas, *Drummond!*—Apparently a large plant, but the base of the stem unknown, clothed with a very white wool, which on the stem is loose and flocculent, on the leaves appressed. Lowest leaves (radical?) 6–8 inches in diameter, obscurely serrate, on long petioles; the upper 2–3 inches long; the uppermost bearing pretty large heads in their axils, on peduncles which are seldom longer than the leaves. Rays about 20. Inner scales of the involucre lanceolate, all finely acuminate. Chaff of the receptacle 3-cleft at the apex.

2. *H. lenticularis* (Dougl.): stem hispid, branching, stout; leaves hispid-scabrous, alternate, ovate, serrate, obtuse at the base, petioled; the lower often cordate, the uppermost often lanceolate and entire; peduncles terminal, sometimes paniculate; heads very large; scales of the involucre oval or ovate, ciliate, abruptly and conspicuously acuminate; achenia appressed-pubescent, often as long as the corolla of the disk; the latter villous at the base; pappus of 2 lanceolate chaffy awns.—*Dougl. in bot. reg. t.* 1265; *Hook.! fl. Bor.-Am.* 1. *p.* 313; *DC.! prodr.* 5. *p.* 586; *Nutt.! in trans. Amer. phil. soc. l. c.* H. tubæformis, *Nutt. gen.* 2. *p.* 177? H. erythrocarpus, *Bartl. ind. sem. hort. Gott.* 1839! (*Linnæa, suppl.* 14. *p.* 125.)

β. corolla of the disk sparsely villous at the base (lower leaves sometimes opposite, and the scales of the involucre narrower).—H. multiflorus, *Hook.! l. c.* partly.

Interior of Oregon, *Douglas, Nuttall!* and from the Platte to Louisiana! Arkansas! and Texas! *β.* Saskatchawan, *Drummond!* Upper Missouri, *Mr. Nicollet!* July–Sept.—A large plant, resembling H. annuus, with a rough hispid (often spotted) stem; the involucre 1–2 inches broad; the rays sometimes 2 inches long and 6–10 lines wide. The stem exudes a resin when wounded. The Indians employ the seeds for food.

3. *H. petiolaris* (Nutt.): stem strigose or hispid, branching; leaves scabrous, alternate (the lower not unfrequently opposite), ovate-lanceolate or ovate, entire or nearly so, on very long petioles; peduncles terminal, naked, bearing solitary (large) heads; scales of the involucre lanceolate, acute or acuminate; corolla of the disk minutely pubescent or canescent at the base; achenia villous; pappus of 2 chaffy awns.—*Nutt.! in jour. acad. Philad.* 2. *p.* 115; *Sweet, Brit. fl. gard.* (*ser.* 2) *t.* 75; *DC.! prodr.* 5. *p.* 586. H. patens, *Lehm.! ind. sem. Hamb.* 1821, *p.* 8? H. integrifolius, *Nutt. in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 366.

Upper Missouri, *Nuttall! Mr. Nicollet!* and Arkansas! in arid places. Aug.—Stem erect, 1–3 feet high. Heads, including the (12–20) large rays, 3–4 inches broad. Scales of the involucre narrowly or broadly lanceolate, with a conspicuous acumination, or merely acute. Leaves mostly acute at the base.

4. *H. cucumerifolius*: hispid-scabrous; stem branching; leaves alternate, or the lower opposite, all cordate, acute or acuminate, coarsely serrate-toothed, on slender petioles; peduncles terminal, naked, bearing a single, or 2–4 clustered (sessile) small heads; scales of the involucre narrowly linear-lanceolate, attenuate-acuminate; corolla of the disk glabrous at the base; achenia hairy; pappus of 2 minutely pubescent small chaffy awns.

Texas, *Drummond!* July–Sept.—Lower part of the stem unknown; but apparently a small species: the branches spotted, terminating in a slender peduncle 4 to 10 inches long. Leaves 1–3 inches long, deltoid-cordate, angulate-toothed, both sides very scabrous. Heads half to two-thirds of an inch in diameter, often in a cluster of 2–4 at the apex of the peduncle. Scales of the involucre lax. Rays about 15. Chaff of the receptacle (or middle lobe) produced into a slender acumination. Achenia oblong, clothed with appressed villous hairs.

5. *H. debilis* (Nutt.): somewhat scabrous; stem slender, decumbent, branching; leaves alternate (rarely opposite), deltoid-ovate, mucronate-acute or acuminate, repand-serrulate, on slender petioles; heads (very small for this division) solitary, on slender terminal peduncles; scales of the involucre narrowly lanceolate, attenuate-acuminate, achenia pubescent; pappus of 2 minutely pubescent small chaffy awns.—*Nutt.! in trans. Amer. phil. soc. (n. ser.)* 7. *p.* 367.

β. stem mostly simple, ascending; lower leaves frequently opposite.

Coast of East Florida, *Baldwin!* *β.* Sand hills of Western Louisiana and Texas, *Dr. Leavenworth!*—The root of the Florida plant is unknown; but that of *β.*, which scarcely differs except in the simple stem (1–2 feet long), and a little more attenuate leaves (1½ inch in length), is annual. Involucre about half an inch in diameter. Chaff of the receptacle 3-lobed; the middle lobe cuspidate-acuminate. Rays 10–14.

* * *Perennial: heads small: rays* 12–24: *receptacle convex: scales of the involucre irregularly imbricated, narrow, at length squarrose, as long as the dark purple disk: leaves opposite, alternate, or scattered, linear,* 1-*nerved.*—Angustifolii.

6. *H. angustifolius* (Linn.): stem scabrous or hairy; leaves linear, elongated, sessile, entire, with revolute margins, 1-nerved, scabrous above, pale or whitish, and often pubescent or hirsute beneath; the lower opposite, the upper alternate; heads on slender peduncles, somewhat corymbose; scales of the involucre narrowly lanceolate, acute, squarrose in fruit; chaff of the receptacle cuneiform-oblong, 3-toothed; achenia glabrous; pappus of 2 small chaffy awns.—*Linn.! spec.* 2. *p.* 906; *Walt. Car. p.* 216; *Michx.! fl.* 2. *p.* 141 (chiefly); *Pursh, fl.* 2. *p.* 572; *Ell.! sk.* 2. *p.* 415; *Bot. mag. t.* 2051; *Bart. fl. Amer. Sept. t.* 105; *DC.! prodr.* 5. *p.* 587. H. foliis linearibus, & Coreopsis foliis linearibus, &c. *Gronov.! fl. Virg.* "Coreopsis, *Mill. ic. t.* 224, *f.* 2." C. angustifolia, *Linn. spec. ed.* 1. Rudbeckia angustifolia, *Linn.! spec.* (*ed.* 2) 2. *p.* 1281. Leighia bicolor, *Cass.*

Damp pine barrens &c. New Jersey! to Florida! Alabama! Kentucky! Louisiana! and Texas! common. Aug.–Oct.—Stem 2–6 feet high, slender, simple or branched. Leaves 2–6 inches long, 2–4 lines, or the lower half an inch wide, with a prominent midrib. Involucre somewhat scabrous or hairy. Rays 12–20, nearly an inch long. Lobes of the disk-corolla brownish purple. Pappus shorter than the achenia.

7. *H. orgyalis* (DC.): stem tall, very smooth; leaves alternate, sessile, linear [very narrow], flat, scarcely denticulate, 1-nerved, slightly if at all scabrous; heads 5–7, corymbose, on long peduncles; scales of the involucre linear, acuminate, ciliolate; chaff of the receptacle linear-subcuneiform, entire, somewhat ciliate at the apex; achenia glabrous, 2–3–4-awned. *DC.! not.* 7. *pl. rar. Genev. p.* 12, *& prodr.* 5. *p.* 587, excl. syn.

Arkansas, *Mr. Pourtales:* cultivated in the Geneva Botanic Garden!—Stem 6–10 feet high. Leaves very numerous and narrow, 3–6 inches long, 1–2 lines wide; the lower remotely denticulate. Heads rather large. Scales of the involucre lax, very slender, attenuate-subulate, longer than the disk. Rays about 15, an inch or more in length. Pappus of chaffy scales rather than awns, usually 2 large and 2 smaller ones, but the latter are sometimes wanting or confluent with the larger.—This is not the H. angustifolius of Linnæus. The H. giganteus *β.* crinitus, *Nutt. gen.* 2. *p.* 127, perhaps belongs to this species, in which case its geographical range extends to the Missouri: but we find no specimen of Mr. Nuttall's plant in the herbarium of the Academy of Natural Sciences.

* * * *Perennial: rays rarely none: receptacle convex: scales of the hemispherical involucre regularly imbricated, appressed, ovate or lanceolate, destitute of foliaceous tips*

or appendages, mostly shorter than the dark purple disk: leaves usually opposite.—Atrorubentes. (Discomela, *Raf.* Harpalium, *Cass.*)

† Rays 7–10, slightly exserted, or frequently wanting! (Echinomeria, *Nutt.*)

8. *H. Radula:* stems simple, often several from the same root, very hirsute below, naked above, bearing a single head; leaves opposite, crowded at the base of the stem, orbicular, obovate, or broadly spatulate, obtuse, entire, 3-nerved or triplinerved, sessile or on short winged petioles, hirsute beneath, hispid above: the upper reduced to lanceolate bracts: scales of the involucre and chaff of the receptacle lanceolate, acuminate, dark-purple; achenia glabrous; pappus of 1–2 small awns, scarcely as long as the proper tube of the corolla.—Rudbeckia Radula, *Pursh! fl. 2. p. 575.* R. apetala, *Nutt.! in jour. acad. Philad. 7. p. 77.* Helianthus apetalus, *Le Conte! ined.; Torr.! ined.* Echinomeria apetala, *Nutt.! in trans. Amer. phil. soc. (n. ser.) 7. p. 356.*

Damp pine barrens of Georgia! Alabama! and Florida! Aug.–Sept.—Stems erect from a decumbent base, perfectly simple, 1–3 feet high, extremely hirsute below, often glabrous above, and naked, except one or two pairs of bract-like leaves. Lower or radical leaves clustered, 1–3 inches broad, often rounded, nearly or quite sessile, very rough and hispid above. Heads mostly larger than in H. atrorubens; the scales of the involucre oblong-lanceolate, ciliate, about the length of the disk. Rays when present yellow, sometimes slightly tinged with purple. Chaff of the convex receptacle membranaceous, with cuspidate-acuminate brownish-purple tips. Corolla dark-purple; the proper tube nearly as long as the limb! Achenia compressed, the edges slightly produced at the apex so as to appear obscurely 2-toothed.

†† Rays 12–20, elongated.

9. *H. heterophyllus* (Nutt.): stem very slender, simple, sparsely hispid, bearing a single head; leaves opposite, entire, hispid above, smoothish beneath; the radical and lowest cauline oval or elliptical, narrowed at the base or somewhat petioled, obscurely triplinerved; the upper narrowly lanceolate, or linear, sessile; scales of the involucre lanceolate, acuminate, ciliate; chaff of the receptacle acute; achenia glabrous; pappus of 2 slender chaffy awns.—*Nutt.! in jour. acad. Philad. 7. p. 74.*

β. lower leaves lanceolate, with a long attenuate base.—H. heterophyllus, *Hook.! compan. to bot. mag. 1. p. 98,* partly.

In dry soil? North Carolina! Georgia! and Alabama! β. Covington, Louisiana, *Drummond!* Florida, *Dr. Chapman!*—Stem 1–2 feet high, naked and often nearly glabrous above. Radical leaves 1½–3 inches long, about an inch wide, somewhat hairy on the veins beneath; the cauline pairs distant; the lower 2–3, or in β. 4–7 inches long, 3–5 lines wide; the uppermost very small. Involucre half an inch in diameter: scales glabrous or pubescent; the exterior oval-lanceolate; the inner narrower and more acuminate. Rays 14–18, large, an inch or more in length. Lobes of the disk-corolla and tips of the chaff brownish-purple. Achenia narrow, when young slightly hairy at the summit. Awns of the pappus lanceolate-subulate, denticulate.

10. *H. atrorubens* (Linn.): stem hirsute and scabrous below, trichotomous or loosely corymbose and naked above; leaves mostly opposite, ovate, oval, or spatulate-oblong, rough and hispid, triplinerved, somewhat serrate, obtuse, abruptly narrowed into margined petioles, the lowest often slightly cordate; scales of the involucre oval or obovate, obtuse, minutely ciliate; chaff of the

receptacle acutish; achenia pubescent at the summit; pappus of 2 squamellate lanceolate awns.—*Linn.! spec.* 2. *p.* 906; *Ait.! Kew.* (*ed.* 1) 3. *p.* 250; *Michx.! fl.* 2. *p.* 140 (in part only); *Ell.! sk.* 2. *p.* 414; not of *Lam.!* of *DC.* ex char., nor of *Hook.!* H. sparsifolius, *Ell.! l. c.* H. silphioides, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 366. Corona-solis minor, &c., *Dill. Elth. t.* 94, *f.* 110.

Dry soil, Virginia! to Florida! Louisiana! and Arkansas! common. Aug.–Oct.—A well-marked species, varying in size (from 1 to 4 feet); the stem bearing 3–5 heads on naked slender peduncles, or several, terminating the very loose paniculate-corymbose branches, clothed with long white hairs towards the base, but often nearly glabrous above. Leaves rather thin, both sides hirsute or hispid, veiny, sometimes nearly entire; the lower 3 to 6 inches long, and 2 to 5 broad; the upper small and in more distant pairs; the uppermost remote and sometimes alternate. Heads small; the 12–16 rays elongated, about an inch long. Involucre rather shorter than the convex disk; the obtuse scales obscurely 3-nerved. Chaff of the receptacle purplish at the tips, entire, or slightly 3-lobed. Corolla of the disk dark-purple at the summit, pubescent at the base of the limb. Pappus of 2 minutely fringed, lanceolate or linear-lanceolate paleæ, rather than awns, one-half to two-thirds the length of the corolla. Achenia glabrous, except the summit.

11. *H. rigidus* (Desf.): stem simple or sparingly branched, rough; cauline leaves opposite, very thick and rigid, lanceolate or oblong-lanceolate, acute or acuminate at each end, subsessile, obscurely serrate or entire, somewhat triplinerved, extremely hispid-scabrous on both sides; the uppermost sometimes alternate; the radical oval, obtuse, strongly triplinerved, petioled; scales of the involucre ovate, mostly obtuse, finely ciliate, numerous, closely imbricated; chaff of the receptacle obtuse; achenia somewhat hairy; pappus of 2 concave lanceolate scales, rather than awns, and frequently with one or several intermediate small scales.—*Desf. cat. hort. Par. ed.* 3. *p.* 184. H. atrorubens, *Michx.! herb.* in part; *Hort. Berol.!* 1839; *Bot. mag. t.* 2668; *Hook.! compan. to bot. mag.* 1. *p.* 98 (var. foliis acutioribus). H. scaberrimus, *Ell.! sk.* 2. *p.* 423; *DC. l. c. p.* 588. H. crassifolius, *Nutt.! in trans. Amer. phil. soc. l. c.* Harpalium rigidum, *Cass. in dict. sci. nat.* 20. *p.* 300; *DC.! prodr.* 5. *p.* 583.

β. branches or peduncles simple, elongated; scales of the involucre ovate-lanceolate or ovate, more acute.—H. diffusus, *Sims, bot. mag. t.* 2020 (poor.) H. Missuricus, "*Spreng. pug. p.* 21;" *Link. enum.* 2. *p.* 352? H. Missouriensis, *Schwein.! herb.*; *Nutt.! in trans. Amer. phil. soc. l. c.* H. atrorubens, *Bot. reg. t.* 508; *Hook.! fl. Bor.-Am.* 1. *p.* 312; *DC. prodr. l. c.* ex char.; not of *Linn.*

Plains and prairies, western part of Georgia, *Elliott!* Illinois, *Mr. Buckley!* and St. Louis, *Drummond!* to the Upper Missouri, *Nuttall! Mr. Nicollet!* Arkansas, *Nuttall!* Louisiana, *Dr. Learenworth!* and Texas, *Drummond!* *β.* Missouri, *Nuttall!* (spec. cult.) and Saskatchawan, *Drummond!* Aug.–Sept.—Plant stout, 1–3 feet high, rather naked above; the rigid stem hispid with short papillose hairs, often smoothish above: the coriaceous thick leaves (cauline 3–5 inches long, an inch or less wide) very rough with short bristles arising from papillæ, which give the surface a cinereous hue, and often a whitish blistered appearance. Heads few, but showy; the disk about an inch in diameter; the 20–24 rays an inch long. Scales of the involucre regularly and closely imbricated in 3–4 series. Receptacle convex: the chaff entire, ciliate on the back towards the summit. Lobes of the disk-corolla purple: style yellow. Achenia somewhat lenticular, hirsute when young, but more smooth when mature, except the edges and summit. The pappus is variable, even in different flowers from the same individual; consisting either of the two scale-like awns without intermediate squamellæ, or of 1–4 of the latter on each side, or with the squamellæ confluent

with the lateral scales, which become dilated and auriculate or lobed at the base, &c. &c.; whence we conclude that Harpalium, *Cass.* is founded upon insufficient and very inconstant characters. The var. *β.* differs but slightly, and passes completely into the other forms of this well-marked species, so that it hardly merits to be distinguished. In some of the Texan specimens, and in those described by Nuttall as H. crassifolius, the leaves are more attenuated to each end, more serrated, and the upper surface comparatively smooth.—The stem sometimes exudes resin in small quantity.

* * * * *Perennial: rays* 12–24*: receptacle convex: scales of the involucre regularly imbricated, appressed, or with somewhat spreading acute or acuminate* (*inappendiculate*) *tips, equalling the yellow disk: leaves opposite, or the uppermost sometimes alternate.*—Lætiflori.

12. *H. lætiflorus* (Pers.): stem scabrous and branching at the summit; leaves oval-lanceolate, gradually acuminate, serrate, contracted at the base into short petioles, triplinerved, very scabrous on both sides; the uppermost often alternate and nearly entire; heads solitary or somewhat corymbose, on naked peduncles; scales of the involucre ovate-lanceolate, acuminate, ciliate, appressed, about the length of the disk; chaff of the receptacle somewhat 3-toothed or entire; achenia glabrous.—*Pers. syn.* 2. *p.* 476; *DC.! prodr.* 5. *p.* 586, excl. syn. *Ell.* H. atrorubens, *Lam.! dict.* 3. *p.* 86, not of *Linn.*

β. leaves all somewhat entire; chaff of the receptacle 3-toothed.—H. tricuspis, *Ell.! sk.* 2. *p.* 422.

N. America; long cultivated in the French Gardens. In barrens, &c. Indiana, *Dr. Clapp!* Dayton, Ohio, *Dr. Short!* *β.* Western part of Georgia, *Elliott!* Aug.–Oct.—A stout and showy plant, 3–4 feet high, somewhat trichotomous above. Leaves somewhat coriaceous, 5–8 inches long, 1½–2½ broad, extremely scabrous above, more or less pubescent, but also very rough beneath, copiously feather-veined, the veins anastomosing with the prolonged lateral nerves. Heads few (in the cultivated plant on long naked peduncles); the scales of the involucre resembling those of H. rigidus *β.*, but fewer and more pointed. Rays 12–16, in the cultivated plant 20 or more, showy, often nearly 2 inches in length. Chaff of the receptacle hairy at the summit. Corolla of the disk yellow, the lobes rarely if ever turning purplish; the anthers brownish, whence the disk appears somewhat dark-colored. Achenia compressed, when young sometimes slightly hairy at the summit. Pappus of two subulate chaffy awns, usually dilated at the base, lacerate-fringed.—Allied to H. rigidus; but the disk-flowers are yellow, as remarked by Persoon. We confidently refer Elliott's H. tricuspis to this species, although the specimens in his herbarium are exceedingly imperfect.

13. *H. occidentalis* (Riddell): stem slender, simple, naked above, somewhat hairy; radical and lower cauline leaves oval or lanceolate-ovate (acutish or obtuse), obscurely serrate, 3-nerved or triplinerved, scabrous above, roughish-pubescent beneath, abruptly contracted into long hairy petioles; the upper very small and remote, entire; heads 1–5 on slender peduncles; scales of the involucre oval-lanceolate, acute or acuminate, ciliate, appressed, scarcely as long as the disk: achenia villous-pubescent towards the summit. —*Riddell, suppl. cat. Ohio plants,* (1836) *p.* 13. H. heterophyllus, *Short! 3rd suppl. cat. Kentucky plants: Hook.! compan. to bot. mag.* 1. *p.* 98, *β.* partly (spec. from St. Louis); not of *Nutt.* (Varies with the stem nearly smooth and glabrous.)

β. plantagineus: stem (sometimes branching) and leaves almost smooth; scales of the involucre scarcely ciliate, attenuate-acuminate, as long as the disk.

Dry barrens, &c., from Michigan! Ohio! and Kentucky! to Missouri!

β. Texas, *Drummond!* July–Sept.—Stem slender, 1 to 3 feet high, nearly leafless, except towards the base. Lower leaves 3–5 inches long, 1–2 broad, usually roughish-pubescent or hirsute beneath; the petioles 5–8 inches long. Rays 12–15, nearly an inch in length. Chaff of the receptacle nearly glabrous, somewhat 3-toothed at the summit, acute. Achenia hairy towards the summit and along the angles. Pappus of 2 lanceolate-subulate awns.—Resembles H. heterophyllus, *Nutt.*, but an entirely distinct species, with a yellow disk. The leaves of the Texan specimens are more coriaceous, and appear glabrous to the naked eye and nearly smooth to the touch; but under a lens they are observed to be clothed with very fine and short appressed hairs.

14. *H. cinereus:* clothed with a close somewhat scabrous and cinereous pubescence; stem somewhat naked above; leaves ovate-oblong, acutish, appressed, serrulate, contracted at the base, sessile; the lowermost narrowed into a winged petiole; peduncles slender; scales of the involucre lanceolate, canescent; immature achenia villous at the summit.

β. *? Sullivantii:* larger and more branched; stem scabrous-hirsute; leaves obscurely serrate, acute, the uppermost often alternate.

Texas, *Drummond!* β. Near Columbus, Ohio, *Mr. Sullivant!*—Stem 2–3 feet high, virgate, sometimes a little branched, bearing few heads nearly as large as those of H. mollis. Leaves rigid, somewhat triplinerved, veiny, clothed with a fine strigose pubescence, which is cinereous on the lower, but more scabrous on the upper surface: the lowest leaves 3–5 inches long, including the narrowed base or petiole; the upper small and remote. Chaff of the receptacle pubescent and more or less 3-toothed at the apex; the middle lobe acuminate. Young achenia villous at the summit (under a lens), and somewhat so on the angles.

15. *H. mollis* (Lam.): stem villous; leaves ovate or lanceolate-ovate, acuminate, with a somewhat cordate and clasping base, serrulate or entire, cinereous-pubescent and slightly scabrous above, tomentose-canescent and reticulated beneath; scales of the involucre lanceolate, villous-canescent; mature achenia nearly glabrous.—*Lam.! dict.* 3. *p.* 81; *DC.! prodr.* 5. *p.* 587; not of *Willd.* &c. H. canescens, *Michx.! fl.* 2. *p.* 140. H. pubescens, *Willd.! spec.* 3. *p.* 2240 (excl. syn. *Vahl.*); *Bot. reg. t.* 524; *Ell.! sk.* 2. *p.* 418; *Hook.! comp. to bot. mag.* 1. *p.* 98.

Barrens and dry prairies from Ohio! Indiana! and the western part of Georgia! to Missouri! Louisiana! and Texas! Aug.–Sept.—A well marked, canescently villous species, 2–4 feet high, simple or sparingly branched at the summit, bearing rather large showy heads on stout peduncles. Leaves all closely sessile, broadest at or near the more or less cordate base, 3 to 6 inches long, often with both surfaces canescent, or the upper slightly scabrous, the lower very soft. Scales of the hemispherical involucre either broadly or narrowly lanceolate, acute or acuminate, somewhat unequal. Rays 15–25, an inch long. Chaff of the receptacle entire, the triangular summit canescent. Pappus of 2 lanceolate pointed chaffy scales, somewhat fringed.

* * * * * *Perennial: heads middle-sized: rays* 8–24*: involucre irregularly imbricated; the scales loose, or with squarrose-spreading often foliaceous summits, as long as the yellow disk* (*achenia glabrous*).—Corona-solis.

† Leaves commonly alternate or scattered, the lower often opposite, feather-veined, sometimes obscurely triplinerved.

16. *H. Nuttallii:* stem smooth; leaves alternate, the lower opposite, narrowly lanceolate-linear, acute, mostly entire, scarcely petioled, both sides

scabrous; scales of the involucre lanceolate-subulate, hirsute-ciliate towards the base; pappus of 2 linear-lanceolate chaffy awns or scales.—H. Californicus, *Nutt.! in herb. acad. Philad. &c.*, not of *DC.*

Plains of Lewis River, *Nuttall!*—Stem apparently strict and simple. Leaves 4–6 inches long, 3–5 lines wide, feather-veined, obscurely triplinerved near the base, somewhat cinereous beneath; the lower remotely and slightly serrate. Heads nearly as large as in H. giganteus. Involucre clothed with whitish hairs, or often smoothish. The disk-corolla is 5-nerved, or with intermediate nerves corresponding with the axis of 2 only of the laciniæ, but not reaching the apex.

17. *H. Californicus* (DC.): stem tall, smooth, loosely paniculate; upper leaves alternate, remote, elongated lanceolate, entire, attenuate at the base, acuminate, slightly ciliate, both sides scabrous, triplinerved; peduncles scabrous; scales of the involucre linear-sublanceolate, a little longer than the disk, squarrose-spreading, roughish-puberulent; achenia glabrous, 2-awned. *DC.! prodr.* 5. *p.* 589.

California, *Douglas!*—We can add little to De Candolle's character, except that the upper leaves (the lower not seen) are slightly petioled, obscurely triplinerved near the base, 3–5 inches long, one-half to an inch wide: heads larger than in H. giganteus; the rigid scales of the involucre nearly equal, not ciliate, very acute: pappus of 2 broadly-lanceolate somewhat fringed scales, tapering into an awn-like point.

18. *H. Maximiliani* (Schrad.): stem strigose-scabrous, branched; leaves alternate (those of the branches sometimes opposite), lanceolate, entire or nearly so, tapering to each end, acuminate, very scabrous and often canescent-strigose on both sides, the lower petioled; scales of the involucre lanceolate-subulate, much attenuate, strigose-canescent; pappus of 2 lanceolate slightly fringed chaffy scales.—*Schrad. ind. sem. hort. Gætt.* 1835; *DC. prodr.* 7. *p.* 290.

Prairies, Missouri, *Prince Neu-wied.* (v. sp. cult.) *Mr. Keating?* in *herb. Schwein.!* Texas, *Drummond!*—A stout branching plant, bearing numerous heads fully as large as those of H. giganteus: the leaves equally rough on both sides; the canescent and numerous much attenuated scales of the involucre sometimes three-fourths of an inch long. In the wild specimens, we sometimes observe two nerves near the axis of some of the laciniæ of the disk-corolla.

19. *H. giganteus* (Linn.): stem roughish-hirsute or scabrous; leaves alternate or scattered (the lowest opposite), lanceolate, acuminate, serrate, very scabrous above, pilose-scabrous beneath, narrowed and ciliate at the base, subsessile; scales of the involucre linear-lanceolate, acuminate, hirsute or strongly villous-ciliate; pappus of 2 short lanceolate-subulate (slightly fringed) chaffy scales.—*Linn.! spec.* 2. *p.* 905 (excl. syn. *Gronov.*); *Ait.! Kew.* (*ed.* 1) 3. *p.* 249; *Willd.! spec.* 3. *p.* 2242: *Pursh, fl.* 2. *p.* 571: *Ell.! sk.* 2. *p.* 426; *Hook.! fl. Bor.-Am.* 1. *p.* 312; *Darlingt.! fl. Cest. p.* 484; *DC.! prodr.* 5. *p.* 589. H. altissimus. (*Linn. spec. ed.* 2. *p.* 1278!) *Jacq. hort. Vindob.* 2. *t.* 162; *Willd. l. c.* H. virgatus, *Lam. dict.* 3. *p.* 85. H. gigas, *Michx. fl.* 2. *p.* 141? Chrysanthemum Virginianum. &c., *Moris. hist.* 3. *t.* 7, *f.* 66 & 67; *Pluk. alm. t.* 159, *f.* 5. (Varies with the leaves nearly all alternate, or sometimes irregularly ternately verticillate.)

β. ambiguus: leaves nearly all opposite and closely sessile, obtuse or rounded at the base!

Thickets and borders of marshes, from Canada! and Saskatchawan! to Kentucky! and the mountainous portion of the Southern States! *β.* Copses, near Brooklyn, Long Island! Aug.–Oct.—Stem 3–10 feet high, branched above, corymbose-paniculate at the summit, smooth or nearly so towards the base. Leaves 2–5 inches long, half an inch to an inch broad, copiously

feather-veined, and usually slightly triplinerved at the base. Rays 15–20, pale yellow, an inch or more in length.—This is a common species in the Northern States, and is very variable in the disposition of the leaves. The var. *β.* grows with, and apparently passes into the ordinary state of the plant; but it is remarkable for having the leaves not only opposite, but broadest near the sessile base, much as in H. divaricatus.

20. *H. grosse-serratus* (Martens): stem smooth and glaucous; leaves alternate, elongated lanceolate or ovate-lanceolate, attenuate-acuminate, sharply (the lower coarsely) serrate, scabrous above, tomentose-canescent beneath, mostly obtuse at the base, all on slender naked petioles; peduncles scabrous; scales of the involucre subulate-lanceolate, slightly ciliate; pappus of 2 lanceolate somewhat fringed chaffy scales.—*Martens, sel. sem. hort. Lovan.* 1839, *& in Linnæa, suppl.* 14. *p.* 133.

β. leaves less canescent beneath, tapering into the petiole; stem scabrous towards the summit.

γ. leaves softly canescent beneath; the lowermost opposite; the upper (more or less serrate) mostly acute at the base, on shorter petioles; stem smooth and glaucous.—H. giganteus, *Hook.! compan. to bot. mag.* 1. *p.* 98.

Dry plains &c. St. Louis, Missouri, *Mr. Duerinck*, (*Martens*) to Western Louisiana, *Dr. Hale!* and Texas (*α.* & *β.*) *Drummond!* *γ.* St. Louis, *Drummond! Dr. Engelmann!* and St. Peter's River, *Mr. Nicollet!* to Ohio, *Mr. Lea! Dr. Paddock! Mr. Sullivant!* Aug.–Sept.—The leaves in the Texan plant are 5–10 inches long, tapering regularly from near the obtuse base to the acuminate apex, on petioles 1–3 inches in length, feather-veined, or slightly triplinerved at the base, the very soft and close tomentose pubescence of the lower surface turning brownish when old. Heads larger than in H. giganteus: the pappus sometimes with intermediate squamellæ. It passes insensibly into var. *γ.*, which closely approaches H. giganteus, but differs in the very smooth stem, the soft hoary pubescence of the leaves, and the slender petioles.—We have seen (in *herb. Schweinitz*) a curious monstrous state of this species, with the disk-flowers either transformed into rays, or into a 3–5-parted corolla, with very long linear (3-nerved) divisions; and with the anthers, and even the (commonly 3-cleft) style also changed into linear, 3-nerved, petaloid bodies.

21. *H. tomentosus* (Michx.): stem stout, hirsute-pubescent; leaves (ample, thin,) alternate or rarely opposite, oval-lanceolate, or the lower ovate, obscurely serrate, tapering to an acute point, contracted at the base, scabrous above, softly pubescent-tomentose beneath; the lowermost usually triplinerved; heads (large) on stout peduncles; scales of the involucre lanceolate, much acuminate, elongated. squarrose, villous; chaff of the receptacle (3-toothed) and the corolla tomentose or hairy at the summit; pappus of 2 subulate (minutely fringed) awns.—*Michx.! fl.* 2. *p.* 141; *Ell.! sk.* 2. *p.* 424; *DC. prodr.* 5. *p.* 589.

β. heads larger; peduncle leafy at the summit; involucre foliaceous (apparently a monstrous state).—H. squarrosus, *Nutt.! in trans. Amer. phil. soc. l. c.*

γ. leaves opposite, oval, acuminate, more distinctly petioled; scales of the involucre less acuminate, not longer than the disk.—H. spathulatus, *Ell.! sk.* 2. *p.* 421. (Leaves not in the slightest spatulate, all opposite in Mr. Elliott's specimen; in others frequently alternate.)

Dry soil, Illinois, and the western portions of North Carolina! Georgia! and Alabama! *β.* Columbus, Georgia! Aug.–Oct.—Stem 4–8 feet high. Lower leaves often a foot long, 3–6 inches broad, often opposite; the upper 3–8 inches long, copiously feather-veined, sometimes triplinerved, but often not at all so; all contracted at the base into a sort of winged petiole. Involucre an inch or more in diameter; the long taper-pointed scales hirsute or

villous, especially on the margins. Rays 12–16, or in β. 20, apparently pale yellow, an inch and a half long. Corolla of the disk pubescent.

† † Leaves opposite, or the uppermost sometimes alternate, 3-nerved or triplinerved.

22. *H. doronicoides* (Lam.): stem branched, smooth below, scabrous-pubescent or hirsute above; leaves opposite or the upper alternate, ovate, or ovate-lanceolate, acuminate, serrate, strongly triplinerved, scabrous above, softly pubescent beneath; the upper sessile or somewhat petioled; the lower (often slightly cordate) on margined petioles; scales of the involucre linear-lanceolate, strongly hirsute-ciliate, acuminate, scarcely longer than the disk; rays 12–15.—*Lam. dict.* 2. *p.* 84 (1789), ex *DC.! prodr.* 5. *p.* 587, excl. syn. *Ell.* &c. H. pubescens, *Vahl, symb.* 2. *p.* 92, ex *DC.*, & *Hook. bot. mag. t.* 2778; not of *Willd.* H. Hookeri, *Don, in Loud. hort. Brit.*

β. leaves appressed-serrate, sometimes closely sessile, finely tomentose-canescent beneath.—H. pubescens, *Hook.! bot. mag. t.* 2778 (excl. syn.), & *compan. to bot. mag.* 1. *p.* 98.

γ. leaves less pubescent beneath; the lower (often a foot long) coarsely serrate-toothed.

Fields and river-bottoms, throughout the Western! and inland portion of the Southern States! July–Sept.—A large species, 5 to 8 feet high, with ample leaves and showy heads. Rays an inch and a half long. Chaff of the receptacle hairy at the summit, and more or less 3-toothed. Achenia glabrous, or when young slightly pubescent above. Pappus of 2 fringed subulate awns, and often with 2 or more intermediate denticulate-fringed squamellæ.—The var. β. often approaches H. tomentosus; and some states of var. γ. are very near H. decapetalus.

23. *H. strumosus* (Linn.): stem simple or sparingly branched and scabrous-pubescent at the summit, smooth below; leaves opposite, ovate-lanceolate, gradually acuminate, serrate with small appressed teeth, very scabrous above, whitish (and smooth or softly pubescent) beneath, somewhat triplinerved, abruptly contracted into short margined petioles; scales of the involucre lanceolate or ovate-lanceolate, acuminate, tomentose-ciliate, equalling the disk, the summits squarrose-spreading; rays mostly 10.—*Linn.! spec.* 2. *p.* 905; *Ait. Kew.* (*ed.* 1) 3. *p.* 249. (H. radice fusiformi, *Hort. Cliff.*; *Mill.! dict. ed.* 7. *no.* 4. Chrysanthemum Canadense strumosum, &c., *Herm. hort. Lugd.!*) H. lævis, *Walt. Car. p.* 215! H. macrophyllus, *Willd.! hort. Berol. t.* 70, & *enum. p.* 920; *DC.! prodr.* 5. *p.* 587. H. decapetalus, *Darlingt.! fl. Cest. p.* 483. H. altissimus, *DC. l. c.*, excl. β.

β. *mollis*: leaves softly canescent beneath.—H. mollis, *Willd.! spec.* 3. *p.* 2240 (excl. syn. *Michx.*); *Pursh, fl.* 2. *p.* 572; *Ell.! sk.* 2. *p.* 418; *Hook.! bot. mag. t.* 3689; not of *Lam.*

γ.? *leptophyllus*: leaves lanceolate, slender, pale but nearly smooth beneath, almost entire.—H. tracheliifolius β. foliis lanceolatis, *Hook.! compan. to bot. mag* 1. *p.* 98.

Copses and banks of rivers, Canada, and throughout the Northern and Western States! to Georgia! and Arkansas! γ. Covington, Louisiana, *Drummond!* July–Sept.—Stem 2–4 feet high. Leaves 3–8 inches long, an inch or less to 3 inches wide towards the base, on petioles half an inch or rarely an inch long, tapering to a sharp point, serrulate, green above; the lower surface of a glaucous or lead-colored hue, or nearly white, but often glabrous, except a few minute hairs on the veins, thence varying to tomentose-canescent; the lateral nerves small, but usually continued by anastomosing with the veins; the branch-leaves sometimes alternate. Involucre more imbricated and appressed than in the following, with short spreading

tips. Rays an inch to an inch and a half long, often half an inch wide, bright yellow. Pappus of 2, or sometimes 3, subulate chaffy awns, and frequently with 2 or 3 small intermediate scales, all ciliate.—The var. *β.* only differs in the degree of the pubescence of the leaf, which is inconstant.—This species is sometimes cultivated in Europe under the name of H. decapetalus; and a different plant appears to have been known as H. strumosus: but if we mistake not, this is the H. strumosus of Miller, of the Kew garden, &c. It is readily distinguished by the form of the leaves, their inconspicuous serratures, and the whitish lower surface.

24. *H. decapetalus* (Linn.): stem branching, smooth below, scabrous at the summit; leaves opposite, or those of the branches alternate, thin, ovate, acuminate, coarsely serrate, triplinerved, scabrous above, smooth or scabrous beneath; the upper ovate-lanceolate; all abruptly contracted into usually winged petioles; scales of the involucre narrowly lanceolate-linear, loose, squarrose-spreading, ciliate, the exterior longer than the disk; rays 8–10 (rarely 13).—*Linn.! spec.* 2. *p.* 905; *Ait.! Kew.* (*ed.* 1) 3. *p.* 249; (*Ell. sk.* 2. *p.* 425?) *Hook.! bot. mag. t.* 3510; *DC.! prodr.* 5. *p.* 588. H. strumosus & H. tenuifolius, *Ell.! sk.* 2. *p.* 420. H. multiflorus (partly) & H. frondosus, *Hook.! fl. Bor.-Am.* 1. *p.* 312. H. frondosus, *Darlingt.! fl. Cest. p.* 483.

γ. frondosus (Hook. bot. mag. l. c.): exterior scales of the involucre larger and foliaceous, one or more of them often changed to leaves.—H. frondosus, *Linn.! amœn. acad.* 4. *p.* 290, & *spec. ed.* 2. *p.* 1277.

Banks of streams &c., Canada! and Northern States! to Kentucky! and the mountains of Georgia! Aug.–Sept.—Stem 2–5 feet high, usually purplish. Leaves 3–6 inches long, 1–3 broad, obtuse at the base, coarsely serrate or toothed, rather paler and often scabrous, but never pubescent beneath; the upper surface scabrous with short often scattered hairs: they are very thin when the plant grows in shade, and frequently perfectly smooth beneath. Heads middle-sized, on slender terminal peduncles. Involucre very variable. Rays rather pale yellow, an inch to an inch and a half long, and one-third of an inch wide. Pappus of 2 subulate chaffy awns.

25. *H. tracheliifolius* (Willd.): stem loosely branching, hairy or somewhat scabrous; leaves opposite, or those of the branches alternate, thin, ovate-lanceolate or oblong-lanceolate, acuminate, sharply serrate, triplinerved, scabrous or roughish-pubescent on both sides, contracted into short petioles; scales of the involucre lanceolate-linear, attenuated, ciliate, very loose, longer than the disk; the exterior often produced into long subulate squarrose-spreading appendages; rays 12–15.—*Willd. spec.* 3. *p.* 2241, & *enum. p.* 920; *Link, enum.* 2. *p.* 332.

Northern States? to Ohio! and Indiana! Aug.–Sept.—What we take for H. tracheliifolius, on the authority of a specimen gathered in the Berlin Botanic Garden, as well as from the original character, is a species with the habit of H. decapetalus, but with narrower and more appressed serrate leaves, not strongly triplinerved, mostly long and slender scales of the involucre, which are often inclined to become foliose, and pretty large pale yellow rays. Link remarks that it is a more hairy plant than H. decapetalus, with smaller flowers: but the stem is nearly glabrous in our cultivated and some of the wild specimens (the heads as large as those of H. decapetalus), while others are quite hirsute; and the lower surface of the leaves is sometimes nearly or quite smooth and glabrous. We are not sure that it has been described under this name by any succeeding author.—The plant cultivated in the Berlin Garden in 1839 as H. prostratus, (very probably the H. prostratus, *Willd. spec.* &c. but not Viguiera prostrata, *DC.*) appears to be a state of this species, and is an erect plant.

26. *H. hirsutus* (Raf.): stem simple, or dichotomous at the summit, hirsute, rough; leaves opposite, more or less petioled, ovate-lanceolate, gradually acuminate, sparsely serrate, mostly rounded or obtuse at the base, 3-nerved or triplinerved, very scabrous above, hirsute-pubescent beneath; scales of the involucre ovate-lanceolate, acuminate, hirsute-ciliate, imbricated, equalling the disk; rays usually 12.—*Raf.! ann. nat.* (1820) *p.* 14; *DC. prodr.* 5. *p.* 591. (Varies with the leaves nearly ovate, usually thickish, but membranaceous when growing in shady places.)

β. diversifolius: cauline leaves broadly ovate-lanceolate; those of the branches oval or ovate, sometimes slightly cordate, nearly entire.—H. diversifolius, *Ell.! sk.* 2. *p.* 423.

γ. trachyphyllus: stem hispid; leaves uniform, ovate-lanceolate, mostly subcordate, large (6 inches long, 2 inches wide at the base), very rough on both sides; heads larger; rays 12–15.

δ. stenophyllus: smaller; stem hispid; leaves narrowly lanceolate, scarcely triplinerved, hispid-scabrous above, roughish-hirsute beneath, the upper entire.

Dry soil, from Ohio! and Indiana! to Louisiana! and the western part of North Carolina! Georgia! and Alabama! *γ.* Arkansas, *Dr. Pitcher!* *δ.* Western Louisiana, *Dr. Hale! Dr. Leavenworth!* Texas, *Drummond!* July–Oct.—A polymorphous species, with larger heads than H. divaricatus (on short peduncles, which are sometimes leafy at the summit); and the scales of the involucre (often scabrous-hirsute) more appressed, but the tips at length more or less spreading: it is also distinguished by the distinct, although short petioles. Pappus of two subulate denticulate awns, longer than the achenia.

27. *H. divaricatus* (Linn.): stem simple, or corymbose-2–3-dichotomous above, smooth, or the branches and peduncles sparsely hispid with spreading hairs; leaves opposite, divaricate, sessile, ovate-lanceolate, or lanceolate from an ovate base, gradually acuminate, serrate, 3-nerved from the rounded or truncate base, very scabrous above, scabrous-pubescent beneath; scales of the involucre lanceolate from a broad base, acuminate, ciliate, imbricated, at length squarrose-spreading, equalling the disk; rays 8–12.—*Linn.! spec.* 2. *p.* 906; *Ait.! Kew.* (*ed.* 1) 3. *p.* 250; *Pursh, fl.* 2. *p.* 576 (excl. the char., which seems to have been made from Michaux's and therefore belongs to H. microcephalus); *Bigel.! fl. Bost. ed.* 2. *p.* 315; *Hook.! fl. Bor.-Am.* 1. *p.* 312 (excl. char.); *Darlingt.! fl. Cest. p.* 482; *DC.! prodr.* 5. *p.* 587. H. truncatus, *Schwein.! in Ell. sk.* 2. *p.* 416. Chrysanthemum Virginianum &c., *Moris. hist.* 6. *t.* 3, *f.* 62.

Borders of thickets and dry fields. Canada! and Saskatchawan! to Louisiana! and Florida! July–Sept.—Stem 1–5 feet high, often purplish and at the same time glaucous. Leaves sometimes ternate, the cauline perhaps never alternate, decussate, divaricate, broadest at the sessile or nearly sessile base, thence tapering to a sharp point, 3–6 inches long, an inch or less (rarely 2 inches) wide at the base. Heads rather small. Pappus of 2 short subulate chaffy awns.

* * * * * * *Perennial: heads small: rays* 5–8, *rarely* 10: *scales of the involucre few, irregularly imbricated, appressed, shorter than the yellow disk; the exterior with squarrose-spreading herbaceous or acuminate tips.*—Microcephali.

28. *H. microcephalus:* stem smooth and glabrous, with numerous slender and spreading 2–3-chotomous branches; leaves (sometimes all opposite, occasionally with all the upper ones alternate,) membranaceous, ovate-lanceolate, attenuate-acuminate, somewhat serrate, petioled, veiny, triplinerved, scabrous above, tomentose-pubescent beneath; heads on slender scabrous-pubescent peduncles; scales of the involucre ovate and ovate-lanceolate, appressed,

ciliate; the exterior with acute or acuminate herbaceous squarrose-spreading tips; rays 5–6; pappus of 2 small subulate chaffy awns.—H. divaricatus, *Michx.! fl.* 2. *p.* 141; *Ell.! sk.* 2. *p.* 428; not of *Linn.* H. strumosus, *var.* pallidus, *Ell.! l. c. p.* 420. H. parviflorus, *Bernh. in Spreng. syst.* 3. *p.* 617? but not of *H. B. & K.*, (which apparently has the priority in publication.)

β. leaves more sharply serrate, the soft pubescence of the lower surface turning brownish; heads rather larger.—H. divaricatus *var.* ferrugineus, *Ell.! l. c.*

γ. upper leaves ovate; heads rather larger; involucre more squarrose.—H. trachelifolius, *Hook.! comp. to bot. mag.* 1. *p.* 98.

Thickets, and in alluvial soil, Upper Canada! (*Goldie, in herb. Hook.*) Western Pennsylvania! Ohio! Indiana! and Kentucky! to the western part of Georgia! and to Louisiana! *γ.* Covington, Louisiana, *Drummond!* July–Sept.—Stems growing usually in tufts, 3–6 feet high, 2–3-chotomously branched. Leaves clothed beneath with a soft pubescence, and sprinkled with minute resinous dots, very veiny, and somewhat reticulated, abruptly contracted into distinct petioles an inch or less in length (it is evidently by a misprint or error of the pen, that Elliott describes the petioles as 3 to 6 inches long!): the lower 6 to 10 inches long, 2–3 broad at the base, tapering to a long acuminate point, the upper similar but smaller and often entire, or frequently elongated lanceolate and slightly falcate. Heads somewhat oblong, nearly half an inch long, about one-third of an inch in diameter. Chaff of the receptacle oblong, pubescent at the apex, and more or less 3-toothed. Rays nearly an inch long. Throat of the disk-corolla scarcely longer than the lobes, pubescent towards the base, as well as the short tube. Pappus shorter than the nearly glabrous achenia.—Somewhat variable in foliage, &c.; but remarkable for its very few rays, which are large for the size of the head, its smooth much-branched stems, and thin distinctly petioled leaves.

29. *H. Schweinitzii:* stem strigose-pubescent, branching above; leaves opposite (or those of the branches alternate), narrowly lanceolate, tapering to a slender acute point, obscurely and sparingly serrulate, narrowed at the base, nearly sessile, triplinerved, very scabrous above, densely tomentose and canescent beneath; heads on slender canescent peduncles terminating the dichotomous branches; scales of the involucre ovate-lanceolate, acute or acuminate, hairy, the tips squarrose; rays mostly 8; pappus of 2 lanceolate or ovate-lanceolate chaffy scales.

Near Salem, North Carolina, *Schweinitz!* and in Mecklenburg County, *Mr. M. A. Curtis!*—Stem apparently 3 to 6 feet high. Leaves thickish; the lower 6–10 inches long, and scarcely an inch wide near the base; the upper 3–5 inches long, half an inch wide, more closely sessile. Heads rather larger than in H. microcephalus: involucre somewhat hirsute-canescent; the scales rather shorter than the disk. Chaff of the receptacle more or less 3-toothed and hairy at the summit. Pappus shorter than the glabrous achenia.

30. *H. lævigatus:* stem glabrous and glaucous, branching; leaves opposite, or the uppermost alternate, oblong-lanceolate, acute, sessile, entire or obscurely serrulate, with scabrous margins, smooth and glabrous on both sides, veiny, indistinctly triplinerved; heads terminating the dichotomous branchlets; scales of the involucre ovate, appressed, mostly with acuminate spreading tips, nearly glabrous; rays 6–8; pappus of 2 lanceolate or ovate concave chaffy scales, and usually of 2 to 4 intermediate squamellæ.

Southern States?—The ticket of our specimen having been lost, we are uncertain as to its particular locality. It belongs to a plant 4 or 5 feet high, branching after the manner of H. microcephalus; with somewhat coriaceous smooth leaves, which are less veiny as well as more obscurely triplinerved

than in that species, pale beneath, acute at the base, but nearly or quite sessile. Heads about twice the size of those of H. microcephalus, of the same shape, on slender peduncles; the scales of the involucre (all shorter than the disk) slightly ciliate. Chaff of the receptacle linear, entire, obtuse. Corolla of the disk with a long throat, and a very short proper tube. Achenia glabrous, or with a few minute scattered hairs. Intermediate scales of the pappus sometimes confluent with the larger ones, all deciduous, as usual in the genus.

31. *H. longifolius* (Pursh): very smooth and glabrous; stems slender, often numerous from the same root; leaves opposite or rarely alternate, linear-lanceolate, acutish, entire, obscurely triplinerved, sessile; the lowermost and radical tapering into slender margined petioles, rarely somewhat serrate; heads few, terminating the simple or dichotomous branches; scales of the involucre ovate-lanceolate; the exterior with lanceolate-subulate spreading tips, as long as the disk; rays about 10, narrow; achenia hairy at the summit; pappus of 2 ovate-lanceolate concave denticulate-fringed chaffy scales, and usually with two intermediate squamellæ.—*Pursh, fl.* 2. *p.* 571; *Ell.! sk.* 2. *p.* 417. Leighia longifolia, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 365.

Western part of Georgia! in wet soil. Sept.–Oct.—An anomalous species, with the aspect of an aquatic Coreopsis, as Elliott remarks, very smooth throughout. Stems 2 to 4 feet high, nearly simple. Leaves 3–8 inches long, one-fourth to half an inch wide, thickish. Heads as large as in H. microcephalus; the glabrous scales of the involucre somewhat fleshy, appressed, except the slender herbaceous tips. Rays about half an inch long. Chaff of the receptacle narrow, glabrous, 3-toothed. Achenia glabrous, except the very summit. Pappus deciduous, as in the whole genus; the small intermediate scales frequently confluent with the larger ones.

‡ *Obscure or little-known species.*

32. *H. pauciflorus* (Nutt.): leaves opposite, linear-lanceolate, acuminate, serrate, nearly smooth; stem naked, trichotomous, few-flowered; scales of the involucre closely imbricated, ovate. *Nutt. gen.* 2. *p.* 177.

Lower Louisiana.—Plant 4–5 feet high. Leaves sometimes ternately verticillate, very long, paler beneath and somewhat pubescent. Ray and disk nearly the same color. *Nutt.*—This species is unknown to us; we find no specimen in the herbarium of the Academy of Natural Sciences.

33. *H. pumilus* (Nutt.): hirsutely pilose and scabrous; leaves opposite, ovate-lanceolate, attenuated below, subpetiolate, nearly entire, 3-nerved; upper leaves lanceolate, alternate; involucrum hoary, hispid, the scales imbricated, lanceolate, acute, as well as the receptacular paleæ; achenium smooth.—*Nutt. in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 366.

β.? Nicolleti: somewhat strigose-canescent: stem simple; leaves (the lowest wanting) lanceolate, 1-nerved, tapering to the base, sessile, obscurely serrulate; the uppermost alternate; scales of the involucre lanceolate or subulate, canescently pubescent; rays 14–20; pappus of 2 oblong-lanceolate chaffy scales.

Rocky Mountains of the Platte, *Nuttall;* who describes it as a perennial, single-stemmed species, about a foot high; the leaves 2–3 inches long, about an inch wide. Heads 3–5, apparently sessile. Rays 16. Chaff of the achenium rather large and wide.—The var. *β.?* collected near Devil's Lake in the N. W. Territory, by Mr. Nicollet, has scabrous hoary leaves, about half an inch wide, and pretty large heads for the size of the stem. It is perhaps different from Mr. Nuttall's plant, which is unknown to us; but the specimens are insufficient. We have seen a fragment of the same species, col-

lected in the same region during Major Long's second expedition; in which all the leaves are opposite and somewhat spatulate, the cauline broader, and nearly agreeing with the character of Mr. Nuttall's H. pumilus.

34. *H. Douglasii*: upper part of the stem and branches scabrous-hirsute; the leaves alternate, rhomboid-oblong, scabrous-pubescent, obscurely triplinerved, entire or slightly toothed, contracted into winged petioles; peduncles terminal, naked; exterior scales of the involucre foliaceous, linear-oblong, obtuse, longer than the disk, spreading or reflexed; rays 12 or more, small; chaff of the receptacle entire; achenia glabrous; pappus of two deciduous subulate chaffy awns.

California, *Douglas!*—The imperfect specimens from which we have ventured to describe this species (mentioned by Hooker & Arnott in the supplement to Capt. Beechey's Voyage, p. 153), consist only of branches, or of the summit of the stem, which appears to have been weak or decumbent: the leaves are 2–3 inches long, including the cuneiform base or winged petiole.

35. *H. hispidulus* (Ell.): stem scabrous; leaves opposite, sessile, ovate-lanceolate, tapering towards the summit, serrulate, scabrous on the upper surface, paler underneath and slightly hispid; scales of the involucre ovate-lanceolate, ciliate; chaff 3-toothed, *Ell. sk.* 2. *p.* 419.

Pine barrens near Louisville, Georgia. Sept.–Oct.—Stem 3–4 feet high. Leaves long, narrow, triplinerved, very obscurely serrulate. Involucre as long as the disk. Rays 8–10, about an inch long. *Ell.*—So wretched are the original specimens in Elliott's herbarium, now before us, that we are unable to offer any decided opinion respecting this species; except that it is not H. divaricatus, but more likely to prove a variety of H. strumosus. The leaves, although nearly or quite sessile, are contracted at the base, paler beneath, and beset with small and scattered, rather rigid white hairs along the veins, and sprinkled with minute resinous atoms (under a lens), similar to what we frequently observe in H. strumosus.

36. *H. multiflorus* (Linn.): rhizoma terete, inflexed; stem erect, branching, scabrous; leaves alternate, sometimes opposite, or the lowest ternate, petioled, toothed, triplinerved, scabrous; the lower cordate, the upper ovate; scales of the involucre lanceolate, the exterior linear-lanceolate, ciliate, spreading, but not squarrose; rays oblong, numerous. *DC.—Linn.!* (*hort. Cliff.*) *spec.* 2. *p.* 905; *Ait. Kew.* (*ed.* 1) 3. *p.* 248; *Lam. ill. t.* 706; *Bot. mag. t.* 227; *DC. prodr.* 5. *p.* 590, probably not of *Pursh*, &c.

Virginia, according to authors (Equatorial America, *Hort. Cliff.*): but we have seen no native specimens that correspond with the cultivated plant, which has been known in European gardens for more than 200 years. We greatly doubt if it were derived from this country; but if so, it probably originated either from H. decapetalus or H. doronicoides. It is well characterized by Linnæus as having cordate-ovate leaves, with the scales of the involucre [elongated linear-lanceolate] loosely imbricated, neither squarrose nor drooping.

‡ ‡ *Introduced species.*

37. *H. tuberosus* (Linn.): root bearing oblong tubers; stem erect, branching, scabrous; leaves alternate, petioled, triplinerved, scabrous, serrate; the lower [opposite] cordate-ovate; the upper ovate, acuminate; petioles ciliate at the base; scales of the involucre linear-lanceolate, ciliate. *DC.—Jacq. hort. Vindob. t.* 161; *Schkuhr, handb. t.* 258; *Beck, bot. p.* 203; *Darlingt. fl. Cest. p.* 484.

Naturalized along fence-rows, &c., in many places, where it becomes a troublesome weed. Said to have been derived originally from Brazil:

cultivated for a very long period for its fleshy tubers.—Rays 12–15. Pappus of 1 to 4 subulate scales or chaffy awns.—*Jerusalem Artichoke.*

H. neglectus, Hort. Berol. 1840; we have seen no description of this species. Is it H. rigidus?

H. villosus, Nutt. is enumerated in *Loud. hort. Brit.*, but no-where described.

98. HELIANTHELLA.

Heads many-flowered; the ray-flowers 10–24, neutral; those of the disk perfect. Scales of the involucre linear or lanceolate, in about 2 series, loose, somewhat foliaceous. Chaff of the receptacle persistent, embracing the achenia. Corolla of the disk cylindrical, elongated, 5-toothed, with a very short proper tube. Branches of the style very hispid, more or less obtuse. Ovary compressed, with one or both margins slightly winged and produced at the summit into a short auriculate and lacerate persistent appendage or into an awn, sometimes with intermediate squamellæ, or an obscure coroniform fringe, glabrous, or ciliate.—Perennial herbs, with linear or lanceolate mostly scattered and sessile entire leaves, and solitary showy heads terminating the stem or branches.

§ 1. *Receptacle convex: appendages of the style slender, hispid throughout.*

1. *H. grandiflora:* stem simple, leafy, scabrous-pubescent; leaves lanceolate-linear, 1-nerved, scabrous-hispid; scales of the involucre lanceolate, acute, somewhat appressed, about the length of the disk; rays 16–20, elongated; chaff of the receptacle as long as the corolla, obscurely 3-toothed; immature achenia oval, compressed, glabrous, with 2 obtuse auricles at the summit, which are somewhat lacerate-fringed, and often bear one or more minute and deciduous aristate squamellæ, the whole summit crowned with a ring of minute hairs; the inner edge slightly winged.

East Florida, *Dr. Leavenworth! Dr. Burrows!*—Stem apparently 3–4 feet high, the base wanting. Leaves without order, sometimes nearly opposite, 2–4 lines wide, obtuse at the base: the lower 2 inches, the uppermost scarcely an inch long. Disk nearly an inch in diameter; the rays sometimes 2 inches long. Corolla sparsely hairy towards the base, the teeth nearly glabrous. The two gibbosities or auricles of the achenia resemble the pappus of some species of Coreopsis; that which is formed by the prolongation of the inner and wing-like margin of the achenium is often largest: there are no intermediate squamellæ, but a crown-like minute ring of bristles which probably takes their place: the small awns or squamellæ, when present, arise from within the auricles.

2. *H. tenuifolia:* stem slender, scabrous, simple, or branching at the summit; leaves very narrowly linear, 1-nerved, very scabrous; scales of the involucre lanceolate-subulate, loose, hirsute, as long as the disk; rays 10–12; chaff oblong, 3-lobed, shorter than the corolla; achenia glabrous, short, quadrangular; the anterior and posterior angles strongest or somewhat margined, each produced at the summit into a stout persistent chaffy tooth, the intermediate angles obscurely toothed.

Sand hills, Middle Florida, *Dr. Chapman!*—Leaves 2 inches or more in length, less than a line wide. Heads not half the size of the preceding. Disk-corolla short, glabrous; the proper tube very short and indurated.

Style bulbous at the base. Summit of the achenium obscurely coroniform, produced into a short somewhat lacerate tooth at the principal angles (the inner angle strongest), and very obscurely toothed at the intermediate angles.

§ 2. *Receptacle flat; the chaff broad, chartaceo-membranaceous, entire: scales of the involucre squarrose-spreading; the inner linear-lanceolate; the exterior foliaceous, or some of them changed into leaves: branches of the style smooth below, terminated by a short dilated or spatulate appendage, with hispid margins: teeth of the corolla densely puberulent externally: ovaries flat, with narrow winged margins.*

3. *H. Douglasii:* stem (the upper portion) hirsute with spreading hairs; striate-angled; leaves oblong-lanceolate, acutish, sessile, triplinerved, glabrous, or sparsely hirsute-pubescent on the midrib and margins; head solitary, pedunculate; the winged margins of the young achenia lacerate-fringed at the summit, not awned; intermediate squamellæ obsolete or none.

Interior of Oregon; "common on the subalpine range of the Blue Mountains, 3–5 feet high, rarely branching," *Douglas!* in *herb. Hook.*—The specimen wants the lower part of the stem: it appears to be nearly allied to Mr. Nuttall's Leighia lanceolata; but the leaves are closely sessile and triplinerved at a considerable distance from the base: the solitary head (the flat disk an inch in diameter, the rays about 24,) is borne on a hirsute peduncle 2 inches long; and the wings of the ovary, which form lacerate appendages at the summit, are not produced into awns. Better specimens, however, are needed for the proper determination of these species.—The corolla in this genus exhibits the ordinary venation of the family; but some flowers of this species present the intermediate nerves, like most Helianthi.

4. *H. lanceolata:* nearly glabrous; stem grooved, bearing 2–3 or more subsessile heads; leaves lanceolate, acuminate at each end, petioled, 3-nerved, a little hairy; the upper and lower alternate, the intermediate opposite; achenia short, obcordate, the narrow (not ciliated) wings produced into slender persistent awns twice or thrice the length of the ovary; intermediate squamellæ obsolete.—Leighia lanceolata, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 365.

Rocky Mountain plains, and Upper California? *Nuttall.*—Having no specimens (except the ovaries), we have drawn the character from Mr. Nuttall's description. The stem is said to be 12 to 18 inches high; the lower leaves 6–8 inches long, an inch broad. Rays 12–14: the chaff retuse.

5. *H. uniflora:* stem and leaves clothed with a short and soft somewhat cinereous pubescence; leaves lanceolate-oblong, rather acute, triplinerved, narrowed at the base, sessile, the middle ones sometimes opposite; head solitary on a long naked peduncle; involucre leafy at the base; the narrow wings of the young obovate achenia ciliate, each bearing at the summit 1 or 2 stout apparently persistent awns as long as the ovary; intermediate squamellæ 2–4, obtuse, lacerate.—Helianthus uniflorus, *Nutt.! in jour. acad. Philad.* 7. *p.* 37. Leighia uniflora, *Nutt.! in trans. Amer. phil. soc. l. c.*

Rocky Mountains, on the sources of the Missouri, *Mr. Wyeth!* June.—Resembles the preceding; and like them with the nerves of the leaves connected by transverse reticulated veinlets. Rays 15–20, more than an inch long.—This species makes a nearer approach to Leighia than the others, but certainly it does not belong to that genus.

Leighia? Hookeriana, Nutt. l. c.= Helianthus Hookerianus, *DC.* =H. longifolius, *Hook.* (not of *Pursh*), is Wyethia robusta, *Nutt.!* *Leighia debilis*, Nutt. l. c. (in a

note) from Maldonado, is apparently L. buphthalmiflora *β. Hook. & Arn.*; and *L. Baldwiniana*, Nutt. l. c. is Pascalia glauca, *Ort.*, *DC.*

90. ACTINOMERIS. *Nutt. gen.* 2. *p.* 131 (1818); *DC. prodr.* 5. *p.* 575.

Pterophyton, *Cass.* (1818)—Actimeris, *Raf.*

Heads many-flowered; the ray-flowers 4–14, elongated, or sometimes wanting. Scales of the involucre foliaceous, nearly equal, in 1–3 series, mostly shorter than the disk. Receptacle convex or conical, chaffy; the chaff embracing the outer margin of the achenia. Corolla of the disk with a more or less inflated 5-lobed limb longer than the tube. Branches of the style terminated by an acute or subulate cone. Achenia compressed, obovate, mostly winged, flat, crowned with 2 nearly smooth persistent awns.—Tall and branching (North American and Mexican) perennial herbs, with alternate or opposite ovate or lanceolate serrate (feather-veined) leaves, which (although often tapering at the base as if petioled) are mostly decurrent on the terete stem. Heads corymbose. Flowers yellow, rarely white.

§ 1. *Receptacle very small, subglobose: scales of the involucre somewhat in a double series, spreading or reflexed, rather shorter than the disk: rays* 4–8 *or rarely* 12, *usually few and irregular: achenia broadly winged: disk squarrose in fruit: flowers yellow.*—ACTIMERIS.

1. *A. squarrosa* (Nutt.): stem more or less pubescent and hairy and winged above; leaves oblong-lanceolate or the lower ovate-lanceolate, tapering or acuminate at both ends, often slightly petioled, scabrous above, hirsute-pubescent or nearly glabrous beneath, serrate; heads in a loose corymbose panicle; scales of the involucre in 2 series; the exterior linear-spatulate or oblanceolate, reflexed; awns stout, much shorter than the achenium.—*Nutt.! gen.* 2. *p.* 131; *Ell. sk.* 2. *p.* 413, excl. *β.* Coreopsis alternifolia, *Linn.! spec.* 2. *p.* 909; *Willd.! spec.* 3. *p.* 2257; *Jacq. hort. Vindob. t.* 110. C. procera, *Ait.! Kew.* (*ed.* 1) 3. *p.* 258. C. acuta, *Pursh, fl.* 2. *p.* 569? Verbesina Coreopsis, *Michx.! fl.* 2. *p.* 134, excl. *β.*

α. alternifolia: leaves alternate, or the lower frequently opposite; rays 4–8.—A. alternifolia, *DC.! prodr.* 5. *p.* 575.

β. oppositifolia: lower leaves generally opposite, sometimes ternately verticillate (*Engelmann, in litt.*); rays 6–12.—A. oppositifolia, *Fresenius, ind. sem. hort. Franc.* 1836, & *in Linnæa*, 12, *suppl. p.* 77; scarcely of *DC. prodr.* 7. *p.* 290?

Dry or alluvial soil, throughout the Western States from Michigan! to Arkansas! Western New York, *Dr. Sartwell!* and in the western portion of the Southern Atlantic States! Aug.–Oct.—Stem 4–8 feet high, glabrous below. Lower leaves a foot or more in length, coarsely serrate or toothed. Chaff ovate, much shorter than the corolla, coriaceous.—The A. oppositifolia was described from a plant produced by seeds sent from Illinois by Dr. Engelmann, who informs us that the common plant of that region generally has opposite leaves. De Candolle's description of A. oppositifolia seems to have been drawn from a variety of A. helianthoides, except the appended "achenia lato-alata," which was probably taken from Fresenius.

§ 2. *Receptacle very small, subglobose: scales of the involucre few in a single series, at length reflexed: achenia usually broadly winged: rays none: disk squarrose in fruit: the corolla white.*—ANACTIMERIS.

2. *A. alba:* stem smooth and glabrous, or scabrous-puberulent at the summit, often slightly winged above; leaves alternate, narrowly lanceolate, tapering to each end, slightly petioled, serrate, scabrous; heads in a loose corymb; scales of the involucre lanceolate-subulate; achenia crowned with 2 slender awns.—A. squarrosa, *var.* alba, *Nutt. l. c.; Ell.! l. c.* Verbesina Coreopsis *β.* alba, *Michx.! l. c.; Pursh, l. c.*; Athanasia paniculata, *Walt. Car. p.* 201.

Alluvial soil &c., S. Carolina to Western Louisiana! Aug.–Oct.—Stem 3–10 feet high. Leaves 5–8 inches long; the lower ones very sharply serrate; the upper often decurrent, but frequently not at all so. Heads smaller than in A. squarrosa. Chaff ovate-lanceolate, shorter than the flowers, membranaceous. Achenia with a very broad white wing; which is frequently so large that the transverse diameter of the fruit is twice as great as the longitudinal; while some of the achenia, even in the same head, are nearly or quite wingless: the awns longer than in the preceding species, and the corolla with a more deeply cleft limb.

§ 3. *Receptacle conical: scales of the involucre in 2–3 series, not spreading or reflexed in fruit: rays 8–15, regular: achenia slightly winged: flowers yellow: stem (and sometimes even the peduncles) conspicuously winged with the decurrent alternate leaves.*—PTEROPHYTON, Cass. (partly.)

3. *A. helianthoides* (Nutt.): stem hirsute-pubescent; leaves alternate, ovate-lanceolate, acute, serrate, closely sessile, canescently villous with soft appressed hairs beneath, strigose-scabrous above; heads few in a contracted simple corymb; peduncles mostly wingless; rays 10–14, long and narrow; achenia crowned with 2 setiform awns.—*Nutt.! gen. 2. p.* 181; *Ell. sk. 2. p.* 413; *DC.! prodr. 5. p.* 575, & *7. p.* 290. (*a.* Nuttallii & *β.* Elliottii!) Verbesina helianthoides, *Michx.! l. c.*

Thickets, and in prairies, Ohio! Illinois! and Missouri! to the western part of Georgia! Louisiana! and Arkansas! June–July.—Stem 2–4 feet high. Leaves about 3 inches long and one or more broad, acute or attenuate-acuminate. Scales of the involucre canescent, lanceolate, oval, or somewhat spatulate. Rays narrowly lanceolate, 18–20 lines long, golden yellow. Corolla of the disk deep yellow, with an elongated throat, 5-toothed. Anthers conspicuously appendiculate. Chaff rigid, lanceolate, longer than the fruit. Achenia oval, pubescent; the awns rather short, very slender, fragile, —The plant cultivated in the Geneva garden has much broader involucral scales than we have observed in indigenous specimens. The habit is quite different from the other N. American species: the disk does not become squarrose; and the receptacle is almost like that of Rudbeckia. A. ovata, and A. tetraptera, *DC. &c.* apparently belong to this section.

§ 4. *Receptacle at length conical: scales of the involucre few, in 2–3 series, not spreading or reflexed in fruit; the exterior lanceolate, much shorter than the disk; the innermost resembling the chaff: rays 7–12: achenia usually wingless, with short awns: flowers yellow: leaves closely sessile, mostly opposite, not at all decurrent.*—APTERON.

4. *A. nudicaulis* (Nutt.): scabrous-hirsute; stem wingless, paniculately

branched at the summit; the branches slender, naked above; leaves oval or lanceolate-oblong, sharply and unequally serrate, obtuse or rather acute, sessile by a slightly cordate base; the uppermost alternate or scattered; heads irregularly corymbose; rays linear, elongated; achenia obovate-oblong, occasionally winged on one or both sides.—*Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 364. Helianthus? aristatus, *Ell.! sk.* 2. *p.* 428.

Dry sterile soil, Georgia! Alabama! and Middle Florida! Aug.–Nov.—Stem 2–3 feet high, often simple. Leaves 2–3 inches long, 1–1½ broad. Heads small, 2–5 on each erect branch; the central or primary on a short peduncle; the lateral on slender spreading peduncles. Chaff ovate-lanceolate, acute, longer than the achenia. Awns erect, variable and somewhat unequal, but usually much shorter than the achenia.—Elliott suspected this plant to belong to Actinomeris, of which there is no doubt: although the achenia are generally wingless, or obscurely margined near the summit, a few of them are sometimes furnished with a conspicuous wing on one or both sides: the heads resemble the preceding section.

§ 5? *Awns of the winged achenia obsolete: leaves opposite, decurrent on the stem: peduncles naked, elongated: rays* 3–4.—ACHÆTA, Nutt.

5. *A.? pauciflora* (Nutt.): hirsute; leaves elliptical, obtuse, serrulate; peduncles very long, bearing 2 heads; achenia with a shallow cup at the summit.—*Nutt.! in Sill. jour.* 5. *p.* 301, & *trans. Amer. phil. soc. l. c.*

East Florida, *Mr. Ware.*—Achenia obovate-oblong, with a conspicuous wing, which extends across the summit, and forms a slight cup.

Div. 3. COREOPSIDEÆ, *DC.* (excl. gen.)—Rays neutral, ligulate, or very rarely wanting. Achenia obcompressed (that is, flattened parallel with the scales of the involucre), not rostrate. Pappus 2- (rarely 4-) toothed or awned (sometimes obscurely coroniform), or none; the awns or teeth often upwardly, but never retrorsely hispid.

100. AGARISTA. *DC. prodr.* 5. *p.* 569; not of *Don.*

Heads many-flowered; the ray-flowers (8–10) neutral; those of the disk tubular, perfect. Involucre broadly campanulate, double; the exterior of (4, *DC.*) usually 5 broadly ovate somewhat foliaceous scales, united at the base; the interior of 8 oblong-ovate acute somewhat membranaceous scales, longer than the exterior series. Receptacle flat; the chaff membranaceous or somewhat hyaline, linear-lanceolate, deciduous with the fruit. Rays obovate-cuneiform, truncate at the summit, many-nerved. Corolla of the disk with a long and slender tube, and an infundibuliform-campanulate deeply 5-toothed limb. Branches of the style tipped with a short mucronulate cone. Achenia obcompressed; those of the ray sterile, (but often containing an abortive ovule) oval, glabrous, margined, destitute of pappus; of the disk oblong or elliptical, with a large basilar callus, densely villous with very long hairs, except the exterior surface in contact with the chaff. Pappus of 2 lanceolate 1-ribbed chaffy scales, arising from the angles of the achenia, about as long as the corolla, deciduous.—An annual very glabrous herb, with

the habit of Coreopsis. Leaves alternate, pinnately and bipinnately parted; the rachis and segments linear. Heads showy, solitary, terminating the terete and naked summit of the stem or branches. Flowers of the (large) ray and of the disk golden yellow.

A. calliopsidea (DC.! l. c.)—*Hook. & Arn.! bot. Beechey, suppl. p.* 352.

California, *Douglas!*—A very pretty plant, a foot or more in height; the bright golden rays about 8 lines long, crenulate at the summit. The chaff which subtends each fertile flower is confluent at the base with the obtuse callus of the achenium, and therefore necessarily deciduous with it: the exterior surface of the latter, which is covered with the chaff, is perfectly glabrous. The two squamellæ of the pappus are longer than the achenium, and are minutely striate, and obscurely denticulate, with a rigid axis, much in the manner of Palafoxia &c.; so that in this respect it accords with Heleniеæ; but its affinities are with Coreopsis, in which the section Leachia has a similar although much smaller pappus.

101. COREOPSIS. *Linn. gen. no.* 981 (excl. spec.); *Schkuhr, handb. t.* 260. Coreopsis, Chrysostemma, & Calliopsis, *Less., DC. &c.*

Heads many-flowered; the ray-flowers about 8 (wanting in one or two species), neutral; those of the disk tubular, perfect. Involucre double, each of about 8 (6–12) scales; the exterior foliaceous, narrower and sometimes more numerous, usually more or less spreading; the interior broader and often rather membranaceous. Receptacle flat or somewhat convex, chaffy; the chaff membranaceous, mostly deciduous with the fruit. Corolla of the disk with a slender tube, and an infundibuliform or campanulate 5-toothed limb. Branches of the style hairy at the summit, and terminated with an acute conical or subulate appendage, or truncate, or obtuse. Achenia obcompressed, not rostrate or tapering at the summit, often winged, 2-awned, 2-toothed, or somewhat 2-squamellate, or sometimes naked at the summit; the teeth or awns usually denticulate or hispid upwardly, but never downwardly.—Herbaceous (American) plants, with opposite or sometimes alternate divided or undivided leaves. Heads terminating the branches, solitary or corymbose. Rays (many-nerved) usually yellow: the corolla of the disk yellow or dark purple at the summit. Anthers blackish.

§ 1. *Branches of the style terminated by an acute cone, or an abrupt subulate appendage: corolla of the ray and disk (with one or two exceptions) yellow.* —EUCOREOPSIS.

* *Achenia wingless, cuneate-oblong, 1-ridged on each side, not incurved, 2- (rarely somewhat 3–4-) toothed or awned: chaff deciduous with the fruit: scales of the exterior involucre distinct, foliaceous, often numerous and irregular, reflexed: rays (rarely wanting) obovate-oblong, obtuse, entire or nearly so: leaves opposite, petioled, mostly ternately or pinnately divided or lobed; the segments serrate, very veiny in the manner of* Bidens; *the primary veins often running to the sinuses.*—Diodonta, *Nutt.*

These plants entirely accord with Bidens § Platycarpæa, except that the awns or teeth of the achenia are not retrorsely barbed, and are often nearly wanting. We do

not find sufficient characters to warrant their separation from Coreopsis; but if this be done, they might with more propriety be joined to Bidens (at least to the broad-fruited section), than erected into a distinct genus, as proposed by Nuttall.

† Rays none.

1. *C. discoidea:* glabrous; stem erect or ascending, diffusely branched; leaves on long petioles, ternately divided; the divisions ovate-lanceolate, acuminate, mostly petiolulate, coarsely serrate, the teeth mucronulate; the uppermost often simple; heads (small) somewhat paniculate-corymbose at the extremity of the branches, on very short peduncles; exterior involucre of 3–5 foliaceous linear or spatulate bracts, usually much longer than the heads; scales of the inner involucre appressed; achenia narrowly cuneiform-oblong or linear cuneiform, hairy; the awns or teeth erect, upwardly hispid, about the length of the corolla.—Bidens? aff. frondosa, *Sullivant! cat. pl. Columb. p.* 30 & 37.

Wet places and swamps, Columbus, Ohio, *Mr. Sullivant!* Feliciana, Louisiana, *Dr. Carpenter!* Western Louisiana, *Dr. Hale!* Texas, *Drummond!* Virginia, *Mr. Rugel!* July–Sept.—①? Stem 1–2 feet high. Lower leaves sometimes undivided. Mature heads 3 or 4 lines long. Exterior involucre sometimes an inch long. Awns sometimes one-fourth or even one-third the length of the achenium, but often very much shorter, even in the same individual.—This plant has exactly the appearance and structure of a Bidens § Platycarpæa, except that the awns are hispid upwardly.

2. *C. bidentoides* (Nutt. under Diodonta): dwarf, diffusely branched, nearly glabrous; leaves lanceolate-linear, incisely toothed, tapering into a petiole; exterior involucre of 3 or 4 linear foliaceous scales often longer than the (small) heads; the inner 5–6, membranaceous, with colored (yellow) tips; awns slender, upwardly hispid, much longer than the corolla or the linear-oblong hispid (immature) achenium.—Diodonta (§? Heterodonta) bidentoides, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 361.

Near Philadelphia, *Nuttall!*—Founded on a single specimen of somewhat uncertain origin, with the aspect of a dwarf Bidens cernua: the small heads rather few-flowered; the long awns exserted: the intermediate angles sometimes with shorter awns. There appear to be no rays; what have been so described being the somewhat dilated and exserted yellow summits of the linear-oblong membranaceous chaff.

† † Heads radiate.

3. *C. aurea* (Ait.): glabrous or nearly so; stem striate; lower leaves 1–2-pinnately 3–5-divided; the upper 3-divided or sometimes simple; the divisions lanceolate, sharply or incisely serrate; heads paniculate; scales of the exterior involucre (mostly 8) linear-spatulate, slightly ciliate, not longer than the interior; achenia cuneiform or obovate-cuneiform, nearly glabrous, ciliate towards the summit, crowned with 2 short and triangular concave and somewhat chaffy teeth, or obscurely 4-toothed by the production of the intermediate angles, or with a somewhat coroniform pappus, from the confluence of the very short or obsolete teeth.—*Ait.! Kew.* (*ed.* 1) 3. *p.* 252. C. coronata, *Linn. spec.* (*ed.* 2) 2. *p.* 1281? (excl. syn. *Plum. & Vaill.*); *Walt.! Car. p.* 215. Diodonta aurea & D. mitis, *Nutt. in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 360.

a. subintegra: upper leaves mostly 3-divided, with the lateral divisions short and small; or the uppermost frequently simple, lanceolate, elongated, petioled, sharply serrate, or entire towards the tapering apex.—C. aurea, *Ait.! l. c.*, not of *Lindl.* C. arguta, *Pursh! fl.* 2. *p.* 567. C. ambigua, *Nutt.! in jour. acad. Philad.* 7. *p.* 75.

β. leptophylla: cauline leaves pinnately 3–5-divided; the terminal divi-

sions linear, elongated, sparingly toothed; the lateral shorter, lobed or incised. —Diodonta leptophylla, *Nutt. in trans. Amer. phil. soc. l. c.*

γ. incisa: lower leaves bipinnately parted or divided; the upper pinnately 3–7-parted, the divisions incised or toothed.—C. mitis, *Michx.! fl. 2. p.* 138.

Wet places throughout the Southern States! originally described from a specimen collected in East Florida by *Bartram!* (v. sp. in *herb. Banks.*) Aug.–Oct.—②? Stem 2–4 feet high, at length much branched. Rays about 8, obovate-oval, rather large. Achenia 2–3 lines long, commonly not more than half as large as in C. trichosperma, and proportionally broader: the summit emarginate-truncate, or with very short somewhat hairy teeth.

4. *C. trichosperma* (Michx.): glabrous; stem somewhat 4-angled; leaves on short sparsely ciliate petioles, pinnately 5–7-parted or divided; the divisions lanceolate or linear-lanceolate, serrate or incised; the uppermost leaves often 3–5-cleft, nearly sessile; heads paniculate-corymbose; scales of the exterior involucre about the length of the interior, linear or subspatulate, somewhat ciliate; achenia narrowly cuneiform-oblong, minutely and sparsely hairy, hispidly ciliate above, crowned with two triangular-subulate hispid teeth or stout awns.—*Michx.! fl. 2. p.* 139; *Pursh, fl. 2. p.* 568; *Ell. sk. 2. p.* 439; *Bigel.! fl. Bost. ed. 2. p.* 315; *DC.! prodr. 5. p.* 572. C. mitis, *Ell. l. c. & DC. l. c.*, as to char. C. aurea, *Lindl. bot. reg. t.* 1228.

β. achenia smaller; the teeth shorter, and sometimes obsolete!

Swamps, Massachusetts! and New York! to Carolina. Aug.–Oct.—②? Stem 1–2 feet high, much branched. Leaves membranaceous. Rays sometimes an inch long, showy, bright yellow. Achenia when mature 4–6 lines long, including the stout teeth, which sometimes taper into short erect awns, but are variable, and occasionally almost wanting: the prominent ridges also not unfrequently produced into obscure intermediate teeth, and all the teeth somewhat connected.—Either this or the preceding species is the C. coronata of the Linnæan herbarium (Virginia, *Sp. Pl.*); but the character, synonymy, and observations all relate to a West Indian plant, the Bidens pentaphylla, &c., *Plum. Amer. ed. Burm. t.* 53, *f.* 2, which is probably Bidens leucantha.—*Tickseed-Sunflower.*

5. *C. aristosa* (Michx.): minutely pubescent, or rarely glabrous; stem quadrangular below; leaves pinnately, the lower bipinnately 5–7-parted or divided, petioled; the divisions lanceolate, sharply serrate, incised, or incisely pinnatifid; heads paniculate-corymbose, numerous, peduncled; scales of the exterior involucre (10–12) about the length of the interior, linear-oblong, minutely hispid or ciliate; achenia flat, oblong-obovate, surrounded with an obscure wing or margin, strongly hispid-ciliate; the hispid awns slender, diverging, about the length of the achenium.—*Michx.! fl. 2. p.* 140; *DC. l. c.* C. aristata, *Willd. spec. 3. p.* 2253; *Pursh, l. c.* (excl. local. S. Car.) Diodonta aristosa, *Nutt.! in trans. Amer. phil. soc. l. c.*

Swamps, Michigan! Ohio! Missouri! to Western Louisiana! Aug.–Sept.—②? Stem 2–3 feet high, at length brachiately much branched. Rays large. Awns (sometimes 4 in number) somewhat variable in length, but longer and more slender than in any related species; the achenium also broader and flatter, with very hispid margins; the surface likewise sparingly hispid. If we mistake not, the achenia are sometimes awnless!

6. *C. involucrata* (Nutt.): minutely pubescent; stem quadrangular below; leaves 1–2-pinnately 3–7-parted; the divisions linear-lanceolate, incisely toothed; heads paniculate; scales of the exterior involucre (about 20) linear-lanceolate, hirsute (as well as the peduncles), longer than the interior; ovaries oval, hispid-ciliate, 2-toothed at the summit.—*Nutt.! in jour. acad. Philad. 7. p.* 74. Diodonta involucrata, *Nutt.! in trans. Amer. phil. soc. l. c.*

Arkansas, *Nuttall!* *Dr. Pitcher!*—Fruit unknown. The plant entirely resembles C. aristosa, excepting the outer involucre, and the short teeth of the ovary.

* * *Achenia oborate-oblong, wingless, obsoletely 2-toothed at the summit: involucre nearly as in* Chrysostemma: *the scales scarcely united: rays entire: appendages of the style ovate-triangular, with a short point: leaves opposite, ample, undivided, serrate, copiously feather-veined.*—Silphidium.

7. *C. latifolia* (Michx.): very smooth and glabrous; stem tall; leaves membranaceous, ovate or ovate-oblong, acuminate, irregularly dentate-serrate, with the teeth mucronate, abruptly contracted into short petioles, pale beneath; heads in small trichotomous corymbs; scales of the involucre 4–5 in each series; the exterior linear, spreading.—*Michx.! fl.* 2. *p.* 137.

High mountains of Carolina, *Michaux!* Mountains of Georgia and North Carolina, *Mr. Buckley!* Aug.—Lower leaves often 6 inches long and 4 broad. Heads small for the size of the plant: rays 5 or 6, large. Chaff oblong-linear. Corolla yellow. Anthers long, black. Mature achenia unknown: the flat ovaries are obscurely margined.

* * * *Achenia elliptical, narrowly winged and somewhat incurved when mature, emarginate: the summit of the wing and the narrow emargination denticulate-lacerate: chaff nearly filiform, somewhat deciduous: scales of the exterior involucre linear, obtuse, foliaceous, spreading, as many as the interior* (6–8) *but much smaller, all united at the base: rays obtuse, entire: corolla of the disk yellow, turning brownish: leaves opposite, petioled,* 3-*divided, or the lowest pinnately* 5-*divided; the divisions entire, feather-veined: heads somewhat corymbose, exhaling the anisate odor of* Lepachys *when bruised!*—Chrysostemma, *Less.*

8. *C. tripteris* (Linn.): smooth and glabrous; stem tall, simple, or corymbose above; divisions of the leaves lanceolate, acute, with very scabrous margins, and with an obscure marginal nerve: heads on short peduncles.—*Linn.! spec.* 2. *p.* 908; *Michx.! fl.* 2. *p.* 138; *Willd.! spec.* 3. *p.* 2253; *Ell. sk.* 2. *p.* 442. Anacis tripteris, *Schrank.* Chrysostemma tripteris, *Less.! syn. p.* 227; *DC.! prodr.* 5. *p.* 568; *Hook. bot. mag. t.* 3553.

β. leaves minutely scabrous-puberulent.

Dry soil, and near streams, Michigan! and Missouri! to Florida! and Louisiana! *β.* Western Louisiana, *Dr. Veatch!* Aug.–Oct.—*4* Stem 4–8 feet high. Heads including the spreading rays an inch or more in diameter.—The denticulate fringe at the summit of the achenia is nearly confined to the wing, so that the pappus can scarcely be called coroniform. The style is nearly as in C. senifolia, delphinifolia, &c., in which species, moreover, the summit of the wing is more or less denticulate.

* * * * *Achenia oblong, narrowly winged, straight or a little incurved, minutely* 2-*toothed or nearly naked and truncate at the summit: chaff linear-filiform, persistent: scales of the exterior involucre oblong-linear, obtuse, about the length of the interior, all united at the base: rays usually acute and entire: leaves opposite, sessile, mostly* 3-*divided, so that each pair resembles a whorl of six; the divisions entire or lobed, never serrate,* 1-*nerved.*—Gyrophyllum. (Eucoreopsis & Gyrophyllum, *Nutt.*, excl. spec.)

9. *C. senifolia* (Michx.): softly and minutely puberulent; stem quadrangular below; leaves closely sessile, 3-divided; the divisions oval-lanceolate, membranaceous, 1-nerved, obscurely veined, entire, scarcely acuminate;

rays lanceolate or oblong, rather acute, sometimes toothed; disk yellow; achenia narrowly elliptical or slightly cuneiform, with 2 minute often deciduous subulate teeth, the narrow wing slightly serrulate towards the summit.—*Michx.! fl.* 2. *p.* 138; *Pursh, fl.* 2. *p.* 568; *Ell.! sk.* 2. *p.* 438; *Nutt.! in jour. acad. Philad.* 7. *p.* 77; *DC.! prodr.* 5. *p.* 572. C. major, *Walt. Car. p.* 214.

β. stellata: glabrous; divisions of the leaves varying from oval-lanceolate (and acute or acuminate at both ends) to rather narrowly lanceolate.—C. stellata (*herb. Banks*); *Nutt.! in jour. acad. Philad.* 7. *p.* 76. C. senifolia, *Hook. bot. mag. t.* 3484. (Varies rarely with the middle division of the leaves 3-parted, according to Elliott.)

Dry woods and in sandy soil, *α.* Virginia to Georgia! in the low and middle country, and St. Louis, *Drummond!* *β.* Virginia! to Alabama! Kentucky! &c. abounding in the upper country. July–Aug.—*2f* Divisions of the leaves 1–3 inches long, simulating a whorl of 6 leaves; the uppermost often undivided. Rays an inch long.

10. *C. delphinifolia* (Lam.): glabrous or minutely puberulent; leaves closely sessile, 3-divided; the divisions entire or 2–3-parted, the middle one often pinnately 5-parted; lobes lanceolate-linear, rather rigid; rays often acute; disk-flowers brownish; achenia obovate-elliptical; the narrow wing minutely denticulate at the summit.—*Lam. dict.* 2. *p.* 108; *DC.! l. c.* C. verticillata, *Ehrh. l. c.; Willd. l. c.; Bot. mag. t.* 156; *Schkuhr, handb. t.* 260; *Pursh, l. c.; Ell. l. c.* C. verticillata *β.* linearis, *Michx.! l. c.* C. Wrayi, *Nutt.! in jour. acad. Philad.* 7. *p.* 76. Ceratocephalus delphinifolius, *Vaill.: Ehret, pict. t.* 9, *f.* 1.

β. rigida: leaves (of the branches often simple) 3-divided; the divisions varying from narrowly linear to linear-lanceolate, entire, or the central one 3-cleft.—C. rigida, *Nutt.! gen.* 2. *p.* 180 (under C. senifolia), & *in trans. Amer. phil. soc. l. c.*

Dry soil, and in pine woods, Virginia to Georgia! Alabama! and Middle Florida! chiefly along the mountains. Aug.—*2f* Stem 1–2 feet high.—A distinct species, very variable in the width of the foliage (the divisions from 1 to 3 lines broad, rigid, very commonly undivided), and intermediate between C. verticillata and C. senifolia *β.* stellata.

11. *C. verticillata* (Linn.): glabrous; stem branched; leaves closely sessile, 3-divided; the divisions pinnately or bipinnately parted; the segments very narrowly linear, obtuse; rays acute at each end, or rarely obtuse and 2–3-toothed; corolla of the disk yellow; achenia obovate-cuneiform, slightly winged, minutely 2-toothed at the summit.—*Linn.! spec.* 2. *p.* 907 (fide *herb.!* & ex syn. *Gronov.!* & *Pluk.!* excl. syn. *Vaill.*); *Lam. dict.* 2. *p.* 108. C. verticillata *β.* tenuifolia, *Michx.! fl.* 2. *p.* 139. C. tenuifolia, *Ehrh. beitr.* 7. *p.* 168; *Willd.! spec.* 3. *p.* 2252; *Schkuhr, handb. t.* 260; *Pursh, l. c.; Ell. sk.* 2. *p.* 439; *Bart. fl. Amer. Sept. t.* 73; *DC.! prodr.* 5. *p.* 572. Chrysanthemum Marianum, &c., *Pluk.! mant. t.* 344, *f.* 4.

Moist places and margin of swamps, Michigan (Lake Huron, and Sault St. Marie, *Dr. Pitcher!*) Ohio, Maryland! to Arkansas! in the Southern States mostly confined to the mountainous districts. July–Sept.—*2f* Stem 1–3 feet high, slender, strongly striate. Leaves appearing as if in whorls of six, whence the Linnæan name, although not strictly correct, is by no means inappropriate, and ought not to be superseded; the segments and rachis almost filiform. Scales of the exterior involucre 8–10, linear or oblong-linear, usually about the length of the interior, rarely only 3 or 4 and almost as long as the rays. Rays bright yellow, 8–12 lines long, narrow; in the cultivated plant sometimes oblong-oval, obtuse and deeply 2–3-toothed.

12. *C. palmata* (Nutt.): glabrous or nearly so; stem simple or slightly

branched above, angled and striate; leaves approximate, rigid, sessile, deeply 3-cleft; the lobes rather obtuse, with scabrous margins, linear, entire, or the middle one often 3-lobed; rays obovate-oblong, sometimes toothed at the apex; corolla of the disk yellow; achenia linear-oblong or elliptical, slightly incurved when mature, narrowly winged, truncate, and crowned with 2 short (often deciduous or obscure) teeth.—*Nutt.! gen.* 2. *p.* 573; *Torr.! in ann. lyc. New York*, 2. *p.* 215; *DC. l. c.* C. pauciflora, *Lehm.! ind. sem. hort. Hamb.* 1833; *DC. l. c.* C. præcox, *Fresenius! ind. sem. hort. Franc.* 1838. Calliopsis palmata, *Spreng. syst.* 3. *p.* 611.

Plains and prairies, Michigan! and on the Mississippi above the Falls of St. Anthony, (*Dr. Houghton!*) to Illinois! Missouri! Arkansas! and Louisiana! June–July.—4 Stem 1–2 feet high, rather rigid. Leaves about 2 inches long, with a cuneiform circumscription, 3-lobed below the middle or nearly 3-parted, narrowed and 3-nerved at the base; the lobes more or less divaricate; the lateral ones frequently cleft in the lower leaves. Heads solitary, or sometimes several, on short peduncles, fully as large as in C. delphinifolia; the rays bright yellow, sometimes entire and a little acute, often toothed, especially in cultivation. Chaff filiform, slightly dilated at the summit, shorter than the flowers.

* * * * * *Achenia nearly orbicular, broadly winged and incurved when mature, often minutely tuberculate, usually furnished with a large callus or tubercle on the inner side at the base and summit, crowned with 2 short squamellate denticulate (often obsolete) teeth: chaff deciduous with the fruit: exterior involucre about the length of the interior: rays (large) obovate or cuneiform, coarsely 3–5-toothed or incised at the summit: leaves opposite, or the uppermost rarely alternate, entire or divided often in the same individual, not serrate, the lower ones petioled: heads on long naked peduncles.*—Leachia, *Cass.* (Coreopsoides, *Mœnch.* Chrysomelea, *Tausch, Nutt.*)

13. *C. auriculata* (Linn.): pubescent with spreading or retrorse hairs, or at length somewhat glabrous; radical and lower leaves on slender hairy petioles, some of them oval or roundish and entire, others 3-parted or divided, with the lateral divisions much smaller; the uppermost on short petioles or nearly sessile, oblong or oval-lanceolate; heads mostly solitary, on elongated glabrous peduncles; scales of the exterior involucre oblong-linear or lanceolate, at length spreading; achenia nearly orbicular, broadly winged, strongly incurved when ripe, often minutely muricate-tuberculate on one or both sides, crowned with 2 very short ciliate-denticulate somewhat squamellate teeth, which are sometimes deciduous or obsolete.

α. cæspitose and somewhat stoloniferous; stems short and slender, simple or sparingly branched near the base; leaves at first hairy, at length nearly glabrous, entire and roundish-oval, or 3-parted, with the lateral divisions very small, or sometimes either pinnately or pedately 5-divided on the same individual; the upper leaves rather acute; rays oblong-cuneiform, coarsely and unequally 4–5-toothed; wing of the achenium entire or very minutely denticulate.—C. auriculata, *Linn.! spec.* 2. *p.* 908 (ex syn. *Gronov., Moris., & Pluk.!*); *Ait.! Kew.* (*ed.* 1) 3. *p.* 252; *Michx.! fl.* 2. *p.* 138; *Pursh, l. c.* C. auriculata *var.* diversifolia, *Ell.! sk.* 2. *p.* 437. C. diversifolia, *DC.! prodr.* 5. *p.* 571; not of *Jacq.*, nor of *Hook.* Chrysanthemum hirsutum Virginianum &c., *Pluk.! alm. t.* 83, *f.* 5, & *especially*, *t.* 242, *f.* 4. C. Virginianum trifolatum &c., *Moris. hist.* 3. *sect.* 6. *t.* 3, *f.* 45. (good figure.)

β. leaves oval-oblong or ovate-oblong, all but the uppermost on slender hairy petioles, mostly obtuse, all entire; rays oval-oblong, rather acute, slightly 2-toothed.

γ. stem elongated, and with the leaves mostly softly pubescent, more or less branched; lower leaves 3-divided or parted, the terminal division 3 or 4

times larger than the lateral ones; the upper often entire, oblong-lanceolate, rather acute, slightly petioled; rays oval-cuneiform, toothed at the summit.—C. auriculata, *Schkuhr, handb. t.* 260; *Willd.! spec.* 3. *p.* 2256; *DC.! l. c.* C. pubescens, (and C. auriculata?) *Ell.! l. c.* Coreopsoides lanceolata, *Mœnch, meth. p.* 594. Anacis auriculata, *Schrank, in acad. Münch. nat.* 5. *p.* 7, ex *DC.* Leachia trifoliata, *Cass. in dict. sci. nat.* 25. *p.* 389. Chrysomelea auriculata, *Tausch. hort. Canal.*, ex *DC.*

δ. stem stout, very pubescent below; leaves pubescent or nearly glabrous; the lower 3-parted with small lateral segments, or not unfrequently entire; the upper nearly sessile, entire, ample (3–4 inches long, and 1 to nearly 2 inches broad), oval-lanceolate or oblong; rays laciniate-toothed.—C. auriculata, var., *Gray! in Sill. jour.* 42. *p.* 45.

Dry soil, in rich woods and along streams, Virginia! and Kentucky! to Middle Florida! and Western Louisiana! more abundant in the mountainous districts. *δ.* Mountains of North Carolina! May–Sept.—*2f* Like most plants which flower throughout the summer, this species presents many variations. We have distinguished only the more important, assuming the smaller and vernal form as the type, which is moreover the plant of Plukenet, Clayton, &c. The stoutest and large-leaved var. *δ.* resembles some of the garden states, which have been long in cultivation. Ripe achenia dark brown.

14. *C. lanceolata* (Linn.): pubescent or nearly glabrous; stems short, ascending, often branched near the base; leaves entire, with ciliate or scabrous margins; the radical and lower cauline oblanceolate or spatulate-oblong, tapering into hairy petioles; the upper oblong-lanceolate or linear-lanceolate, sessile, slightly connate at the base (the uppermost rarely alternate); heads mostly solitary, on very long naked peduncles; scales of the exterior involucre ovate-lanceolate; rays deeply 4–5-toothed or incised at the summit; achenia nearly orbicular, incurved when mature, broadly winged, crowned with 2 very short auriculiform denticulate squamellæ, which when old become (especially in cultivation) subulate teeth.—*Linn.! spec.* 2. *p.* 908; *Michx.! fl.* 2. *p.* 136; *DC.! prodr.* 5. *p.* 570. Coreopsis, *Linn.! hort. Cliff. p.* 420. Leachia lanceolata, (& L. crassifolia?) *Cass. l. c.* Chrysomelea lanceolata, *Tausch, l. c.*

α. succisæfolia (DC.): leaves glabrous or slightly pubescent, more or less ciliate (the stem often elongated and more branched in cultivation).—Bidens succisæfolio, radio amplo laciniato, *Dill. Elth. t.* 48, *f.* 56.

β. angustifolia: leaves glabrous, narrow, mostly ciliate; the cauline ones linear; stem short, or rarely somewhat elongated.—C. lanceolata *β.* glabella, *Michx.! l. c.; DC.! l. c.* (chiefly.) C. lanceolata, *Hook. ! fl. Bor.-Am.* 1. *p.* 311.

γ. villosa (Michx.! l. c.): very hairy or villous throughout; the peduncles and involucre (and sometimes the surface of the spatulate or oblong-lanceolate leaves) becoming glabrous.—*Pursh, l. c.; DC.! l. c.* C. crassifolia, *Ait. Kew.* (*ed.* 1) 3. *p.* 253 (fide *Pursh, &c.*); *Ell. sk.* 2. *p.* 434. C. oblongifolia, *Nutt.! in jour. acad. Philad.* 7. *p.* 76.

Rather damp soil, Virginia! and N. Carolina! to Florida! Western Louisiana! and Missouri! North shore of Lake Superior, *Dr. Pitcher!* and Lake Huron, *Dr. Todd*, fide *Hook.* June–Aug.—*2f* or ② ? Heads showy: the rays an inch long, bright yellow. Achenia blackish when mature.

15. *C. grandiflora* (Nutt.): glabrous; stem slender, striate-angled, simple or branching; leaves on hirsute or somewhat ciliate petioles; the radical lanceolate or linear-spatulate, or sometimes divided; the cauline 1–2-pinnately or ternately 3–5-parted, with the segments or lobes narrowly linear or lanceolate, canaliculate; the uppermost sessile; heads solitary, on long naked peduncles; scales of the exterior involucre lanceolate or ovate-lanceolate,

about the length of the inner, acute or acuminate; rays 4–5-cleft at the apex; achenia orbicular, winged, incurved, crowned with 2 short denticulate-fimbriate squamellate teeth.—*Nutt.! in hort. Barclay, & in trans. Amer. phil. soc. l. c. p.* 358; *Hogg, in Sweet, Brit. fl. gard. t.* 175; *DC.! prodr.* 5. *p.* 572.

β. longipes: heads rather smaller; exterior involucre shorter than the inner; radical leaves commonly undivided.—C. longipes, *Hook.! bot. mag. t.* 3586; *DC. prodr.* 7. *p.* 290.

γ. subintegrifolia: radical and lowest cauline leaves narrowly linear or lanceolate, entire; one or more of the upper 3-parted, the lateral segments smaller; exterior involucre usually shorter than the inner.—C. Boykiniana, *Nutt.! in trans. Amer. phil. soc. l. c.*

Plains of Arkansas, Western Louisiana, and Texas, *Nuttall! Dr. Pitcher! Dr. Leavenworth! Dr. Engelmann! Drummond!* (*α.* & *β.*) Also Alabama, *Dr. Gates!* *γ.* Texas, *Drummond!* Southern Missouri, *Dr. Engelmann!* Georgia, *LeConte! Dr. Boykin!* July–Sept.—*2* Plant 8–12 inches high. Heads resembling those of C. lanceolata. Chaff attenuate-filiform. Achenia brownish, often minutely tuberculate on one or both sides, as in all the species of this section.

16. *C. coronata* (Hook.): stem slender, erect or diffusely branched, naked and glabrous except near the base; leaves flaccid, hairy, on slender petioles, spatulate-oval or oblong, obtuse, entire, or the lowest 3–5-divided; the lateral divisions oblong, small; scales of the exterior involucre lanceolate, ciliate, shorter than the inner; rays 5-cleft at the apex, "marked with a purple spot at the base"; achenia oval, incurved, narrowly winged, crowned with 2 (2–3) squamellate teeth.—*Hook.! bot. mag. t.* 3460, not of *Linn. &c.*

Texas, *Drummond! Mr. Lindheimer!*—① Plant 8–15 inches high, either simple or branched near the base; which alone is leafy: the naked portion, or peduncle, 6–10 inches long. Heads smaller than in C. lanceolata, &c. Limb of the leaves an inch long.—The rays are sometimes entirely yellow.

§ 2. *Branches of the style truncate and slightly penicillate at the apex: achenia naked at the summit, or with two short or obscure teeth, more or less incurved, often minutely tuberculate: chaff deciduous with the fruit: exterior involucre small: rays mostly 2-colored (yellow with a brownish-purple spot at the base), toothed: disk-flowers dark purple or brownish: leaves opposite, 1–2-pinnately divided, the lobes entire.*—CALLIOPSIS, Reichenb., DC.

* Achenia wingless.

17. *C. Drummondii:* annual, more or less pubescent or hirsute with jointed hairs; leaves pinnately 3–5-divided, or sometimes simple; the divisions (or leaves) oval or oblong, entire, or with the margin undulate; scales of the exterior involucre lanceolate-acuminate, a little shorter than the interior; rays unequally 5-toothed, twice the length of the involucre: achenia obovate, wingless, strongly incurved, naked or minutely 2-toothed at the apex, smooth or obscurely tuberculate.—C. diversifolia, *Hook.! bot. mag. t.* 3474, not of *DC.* Calliopsis Drummondii, *Don, in Sweet, Brit. fl. gard. ser.* 2. *t.* 315.

β. leaves mostly pinnately 3–7-divided; the divisions entire, or frequently 3-parted.

Texas, *Drummond!*—Stem 6–20 inches high, branched above. Rays with a small purplish spot at the base. Achenia much incurved.

18. *C. tinctoria* (Nutt.): annual, glabrous; lobes of the leaves linear-oblong and linear; scales of the exterior involucre very short, acute; rays 3 lobed at the summit, twice the length of the interior involucre; achenia oblong, wingless, minutely tuberculate on both sides, or sometimes nearly smooth.—*Nutt.! in jour. acad. Philad. p.* 114; *Bart. fl. Amer. Sept.* 2. *t.* 45; *Bot. mag. t.* 2512; *Bot. reg. t.* 846; *Brit. fl. gard. t.* 72. Diplosastera tinctoria, *Tausch, hort. Canal.*, ex *DC.* Calliopsis bicolor, "*Reichenb. mag. t.* 70"; *Spreng. syst.* 3. *p.* 611. C. tinctoria, *DC.! prodr.* 5. *p.* 568; *Hook. bot. mag. t.* 3511. (*β.* atropurpurea).

Damp prairies, from the Upper Missouri, (*Mr. Nicollet!*) to Western Arkansas, *Nuttall! Dr. Pitcher! Dr. Leavenworth! Dr. Engelmann!* Western Louisiana, *Dr. Hale!* Texas, *Drummond! Dr. Leavenworth!* (Very common in cultivation.) July–Oct.—Stem 1–3 feet high. Rays golden yellow, towards the base deep brownish-purple: in cultivation nearly the whole ray sometimes becomes dark purple, as figured in *Bot. mag. t.* 3511.

* * Achenia winged.

19. *C. Atkinsoniana* (Dougl.): perennial, glabrous; lobes of the leaves linear or linear-spatulate; scales of the exterior involucre linear-oblong, obtuse, somewhat scarious; rays obtusely 3-toothed, thrice the length of the interior involucre; achenia elliptical, distinctly winged, crowned with 2 very short (often deciduous) subulate teeth.—*Dougl. in Lindl.! bot. reg. t.* 1376. Calliopsis Atkinsoniana, *Hook.! fl. Bor.-Am.* 1. *p.* 311; *DC.! prodr.* 5. *p.* 568.

Oregon, near the coast, *Douglas! Dr. Scouler!*—This species, now common in the European gardens, appears to be the only one indigenous to Oregon, or any part of the country west of the Rocky Mountains. It greatly resembles C. tinctoria, but is a larger plant.

20. *C. cardaminefolia;* annual, glabrous; lobes of the leaves obovate-oblong, of the upper linear-spatulate or narrowly linear; scales of the exterior involucre very short, rather obtuse; rays 3-cleft at the summit, twice the length of the interior involucre; achenia broadly oval, winged, often with 2 short subulate teeth, smooth or very minutely tuberculate.—Calliopsis cardaminefolia, *DC.! l. c.*

β. angustiloba: lobes of the leaves all narrowly linear; achenia tuberculate.

Texas, *Berlandier!* *β.* Western Louisiana, *Dr. Hale!*—The young achenia are usually crowned with two subulate teeth, which are united with the wing, and sometimes project a little beyond it.

§ 3. *Branches of the style truncate or terminated with a very obtuse cone: achenia straight or slightly incurved, crowned with two upwardly serrulate or hispid awns or subulate teeth; the winged margin mostly fringed or dissected: chaff deciduous with the fruit: exterior involucre small: rays about 3-toothed or cleft at the summit, yellow: disk-flowers dark purple: stem naked and dichotomously corymbose at the summit: leaves opposite or alternate (often in the same species), entire or sparingly lobed.*—COREOLOMA.

* *Achenia slightly incurved, surrounded with a broad entire wing.*—Calliopsidium.

21. *C. Leavenworthii:* glabrous; stem terete, slender, dichotomously branched at the summit; leaves opposite, narrowly linear, entire, or frequently with two lateral linear lobes; the lower ones petioled; scales of the exterior involucre very short, ovate-lanceolate; rays 3-toothed; achenia (in-

cluding the broad whitish wing) roundish oval, crowned with 2 awn-like teeth, which exceed the wing.

Tampa Bay, and near Fort Drane, Florida, *Dr. Leavenworth!*—☉ or 2|? Stems often several from the same root, 1–2 feet high. Lower leaves 3–4 inches long, scarcely a line wide. Rays 5–6 lines in length, bright yellow: disk brownish-purple. Achenia smooth; the wing of each side as broad as the achenium itself: the awns or teeth minutely serrulate, somewhat exceeding the wing.—Differs from the Calliopsides with winged achenia only in the more conspicuous teeth, and the entirely yellow rays.

* * *Achenia not incurved; the margin serrulate, or with a lacerate or pectinately dissected wing.* (Eublepharis & Rhabdocaulis, *Nutt.*, excl. spec.)

22. *C. gladiata* (Walt.): glabrous; stem terete, striate, dichotomously corymbose at the summit; leaves somewhat fleshy, alternate, remote, entire, or the upper ones frequently with two lateral lobes; the lowermost oblong-lanceolate, sometimes 1–2-ternately-parted, tapering into a long margined petiole partly clasping at the base; the upper sessile, elongated lanceolate or linear-lanceolate, mostly acute; bracts alternate or opposite, subulate; scales of the exterior involucre ovate-lanceolate; rays obovate, 3-lobed at the summit; achenia narrowly elliptical or somewhat obovate-oblong, surrounded by a conspicuous pectinate fringe, crowned with 2 slender serrulate-hispid awns about half the length of the corolla.—*Walt.! Car. p.* 215; *Nutt.! gen.* 2. *p.* 180; *Ell. sk.* 2. *p.* 444; *DC. l. c.?* C. dichotoma, *Michx. l. c.*, partly?

Damp pine barrens, North Carolina! to Georgia! and Florida! Aug.–Sept.—2|. Stem 2–3 feet high, naked above, 2–3 times dichotomous at the summit, and often bearing 9–12 heads on slender pedicels. Lower leaves, including the petiole, often 8–10 inches long, somewhat veined: the upper 4–5 inches long, and decreasing upwards, 1-nerved: the uppermost rarely opposite. Achenia glabrous, or minutely papillose-scabrous, about twice the length of the awns; the linear segments of the fringed margin often as long as the achenium itself is wide, appearing like a dissected wing.

23. *C. angustifolia* (Ait.): glabrous; stem acutely 4-angled, virgate, slender, dichotomously branched above; leaves entire, opposite, or the lower frequently alternate; the radical and lowest cauline oblanceolate or spatulate, tapering into a slender petiole; the others spatulate-linear, obtuse, narrowed towards the base, sessile, the uppermost bract-like; scales of the exterior involucre ovate, obtuse; rays obovate-cuneiform, 3-lobed at the summit, the middle lobe largest; achenia elliptical, surrounded by a lacerate-fimbriate wing, crowned with 2 short upwardly hispid awns.—*Ait.! Kew.* (*ed.* 1) 3. *p.* 253. C. dichotoma, *Michx. fl.* 2. *p.* 137, (at least in part.) C. linifolia, *Nutt.! in jour. acad. Philad.* 7. *p.* 75. C. (Rhabdocaulis) angustifolia & linifolia, *Nutt.! in trans. Amer. phil. soc. l. c.*

Moist pine barrens, &c., Florida, *Bartram! Dr. Chapman! Mr. Croom!* Alabama, *Dr. Gates!* &c. New Orleans, *Dr. Ingalls!* Western Louisiana, *Dr. Hale!* Borders of Texas, *Dr. Leavenworth!* N. Carolina, (near Wilmington?) *Mr. Curtis!* June?–Sept.—2|. Stem 1–3 feet high, grooved between the angles. Leaves more frequently all opposite, rarely all alternate, rather thick and opaque, often obscurely punctate; the cauline ones short (1–2 inches long), and becoming smaller towards the summit; those of the branches reduced to spatulate-linear bracts. Heads loosely dichotomous-corymbose; the slender pedicels spreading. Corolla of the disk dark purple, much longer than the setiform awns of the achenia.

24. *C. integrifolia* (Poir.): glabrous; stem terete below, striate-angled and often corymbose above; leaves ovate or oval-lanceolate, entire, with a

whitish and somewhat cartilaginous smooth or ciliate-scabrous margin; the lower ones mostly alternate, and tapering into a margined somewhat clasping petiole, the uppermost much smaller, opposite, sessile; heads few; scales of the exterior involucre oblong-linear, obtuse, scarcely half the length of the interior; rays narrowly cuneiform, 3-lobed, 3–4 times the length of the involucre; achenia (immature) narrowly cuneiform-oblong, wingless, the margin minutely ciliolate-hispid, crowned with 2 very short upwardly serrulate awns.—*Poir. suppl.* 2. *p.* 252; *DC.! prodr.* 5. *p.* 570. C. Œmleri, *Ell. sk.* 2. *p.* 436?

Carolina, *Bosc!* Georgia, "near the junction of Broad and Saluda Rivers, *Mr. Œmler*," ex *Elliott.* Near Columbus, *Dr. Boykin!* and on the banks of Spring Creek, Decatur County, in the same State, *Dr. Chapman!*—①? Stem 2–3 feet high. Lower leaves 3–5 inches long, with a petiole nearly the same length, thick, rather acute at each end, with a conspicuous midrib, obscurely feather-veined, varying in outline from ovate or oval to elongated lanceolate; the upper shorter and often opposite, on short connate petioles; the uppermost reduced to bracts, always opposite. Rays bright yellow, nearly an inch long. Corolla of the disk dark purple at the summit. Branches of the style dark purple, terminated by a very obtuse or capitate minutely hairy cone. Awns rather stout, scarcely one-fourth the length of the immature achenium.

§ 4. *Branches of the style truncate or terminated with a very obtuse cone: achenia as in* Coreoloma, *or naked and wingless: exterior involucre small: rays* 3–5-*toothed, rose-red: the disk-flowers light yellow: leaves alternate or opposite, undivided, and entire.*—Cosmella.

25. *C. nudata* (Nutt.): glabrous; stem terete, dichotomously branched above; leaves few and remote, alternate, terete, subulate; the lower elongated; the upper very short; scales of the exterior involucre much shorter than the interior; rays (rose-red) broadly cuneiform-obovate, crenately 3–5-toothed; achenia elliptical, surrounded with a narrow laciniately lacerate wing, crowned with two short upwardly fimbriate-serrulate awns.—*Nutt.! gen.* 2. *p.* 180, & *in trans. Amer. phil. soc. l. c.* Calliopsis nudata, *Spreng. syst.* 3. *p.* 611.

Near St. Mary's, West Florida, *Baldwin.* Apalachicola, *Dr. Chapman!*—4? Stem 2–3 feet high, somewhat corymbosely branched, and bearing 3 to 6 or more showy heads on naked pedicels. Leaves, or rather petioles without lamina, partly clasping at the base; the lower ones (2–3) about 6 inches long, subulate-filiform; the uppermost reduced to minute bracts. Rays showy, about 8 lines long. Lobes of the corolla of the disk puberulent internally. Anthers brownish. Branches of the style yellowish, terminated by a short, pubescent, rather acute cone. Awns scarcely exceeding the wing of the achenium.—This plant resembles Cosmos in the color of the flowers, and the section Coreoloma in the achenium and style, dichotomously corymbose heads, &c. The following species is a Calliopsis except in the color of the flowers.

26. *C. rosea* (Nutt.): stem leafy, mostly branched; leaves opposite, narrowly linear, entire, obscurely 1-nerved, narrowed and slightly ciliate at the base; heads on short peduncles; exterior involucre very small; rays (pale red, rose-color, or sometimes white) oblong, slightly 3-toothed; achenia oblong, wingless, somewhat incurved when mature, and obscurely tuberculate on the margins, crowned with an obscure truncate coroniform pappus.—*Nutt.! gen.* 2. *p.* 179, & *trans. Amer. phil. soc. l. c.*; *Bigel.! fl. Bost. ed.* 3. *p.* 338; *Bart. fl. Amer. Sept. t.* 12. Calliopsis rosea, *Spreng. syst.* 3. *p.* 611.

Sandy or grassy swamps, from Plymouth, Massachusetts, *Mr. Oakes! Mr. Russell!* Nantucket, *Mr. T. A. Green!* and Rhode Island, *Prof. Bailey!* to New Jersey! and Georgia. July–Aug.—2f Plant slender, 8–15 inches high. Heads small. Appendages of the style (yellow) slightly capitate and truncate.

C. trifida (Lam. ill. t. 704) is of unknown origin, and is unlike any North American species.

C. flexicaulis (Raf.): "stem simple, flexuous; leaves linear, thickened, the lower ones attenuated, the upper ones opposite; flowers terminal, crown-flowered: floscules 4-fid," *Raf. in med. repos.* (*hex.* 2) 5. *p.* 361, (South New Jersey) is not likely to be identified.

C. aspera (Pursh): "leaves lanceolate-linear, rough; the upper alternate, the lower opposite; stem one-flowered," *Pursh*, *fl.* 2. *p.* 570, is said to have been described from a Maryland specimen in the Banksian herbarium; where, however, we did not recognize the species.

C. acuta (Pursh, l. c.): "leaves ovate-lanceolate, acute, denticulate, somewhat hairy, alternate; flowers corymbose-paniculate," which we were also unable to identify in the Banksian herbarium, is perhaps Actinomeris squarrosa.

C. alata (Pursh, l. c.) is doubtless Verbesina Siegesbeckia.

PERAMIBUS, *Raf.*—Under this name Rafinesque founded a genus in his *Annals of Nature* (1820), which is chiefly characterized by having triangular naked achenia, and the scales of the involucre alternately longer and shorter in a single series. It was established on a Kentuckian plant. P. hirtus. which is Rudbeckia triloba! To the genus he referred, somewhat doubtfully. several species which he had not seen, viz: his own Coreopsis scabra of the *Florula Ludoviciana*, the C. acuta. *Pursh*, and the C. palmata, rosea and nudata of Nuttall, none of which accord with his character.

Div. 4. BIDENTIDEÆ, *Less.*, *DC.*—Rays neutral, ligulate, or sometimes wanting. Achenia obcompressed, or often tetragonal or terete, and rostrate. Pappus of 2–4 (rarely 5–6) retrorsely barbed or scabrous hispid awns.

102. COSMOS. *Cav. ic.* 1. *p.* 9, *t.* 14 & 79; *DC. prodr.* 5. *p.* 606.

Heads many-flowered; the ray-flowers (about 8) neutral; those of the disk tubular, perfect. Involucre double, each of 8–10 acute or acuminate scales, more or less united. Receptacle flat; the chaff membranaceous, attenuate-acuminate. Corolla of the disk with a slender tube and a 5-toothed limb. Anthers with a scarious cordate appendage. Branches of the style thickened and very hairy or bearded at the summit, terminated by a subulate cone. Achenia tetragonal or terete, attenuate or rostrate at the summit, sometimes stipitate, crowned with 2–4 retrorsely barbed or scabrous-hispid deciduous awns.—Annual or perennial (mostly Mexican) branching herbs, with opposite 1–2-pinnatifid or divided leaves, the lobes mostly entire. Heads on slender peduncles terminating the branches. Rays purple, violet, or rose-color: disk-flowers yellow; the anthers brown.

1. *C. caudatus* (H. B. & K.): glabrous or slightly hairy; leaves petioled, bipinnately parted; the segments lanceolate, feather-veined, ciliate-scabrous,

cuspidate; scales of the involucre scarcely united; the exterior linear-lanceolate, cuspidate, ciliate, spreading, nearly equalling the scarious or colored interior series; chaff obtuse; achenia 4-angled, tapering into a very long upwardly scabrous beak, crowned with 2 spreading awns.—*H. B. & K. nov. gen. & spec.* 4. *p.* 240; *DC.! prodr.* 5. *p.* 606. Bidens Berteriana, *Spreng. syst.* 3. *p.* 454; *DC.! in Wight, contrib. p.* 19.

Key West, *Mr. Blodgett!* A common West Indian species; also naturalized in the East Indies.—2|. Rays rose-color, 3-cleft at the summit, scarcely longer than the involucre. Achenia (about 20) nearly an inch long.

103. COSMIDIUM. *Torr. & Gray, mss.; Nutt. in trans. Amer. phil. soc. (n. ser.)* 7. *p.* 361.

Heads many-flowered; the ray-flowers about 8, neutral, or sometimes wanting; those of the disk tubular, perfect. Involucre double, each of 8 scales; the interior oblong-ovate, somewhat membranaceous, united to the middle, much larger than the exterior. Receptacle flat; the chaff scarious, oblong, obtuse, with 2 approximate colored nerves, shorter than the flowers, partly investing the achenia, and deciduous with them. Corolla of the disk with a very slender tube, and a deeply 5-cleft limb; the segments long and linear, recurved. Anthers and style as in Cosmos (the base of the latter dilated into a conspicuous bulb.) Achenia linear-oblong (obscurely angled when young), terete or slightly obcompressed, a little incurved and tuberculate on the back when mature, not rostrate, the abrupt summit crowned with 2 dentiform retrorsely pectinate-ciliate (persistent?) awns.—Annual and perennial dichotomous or brachiate glabrous herbs, with slender branches naked at the summit, and terminated by rather small heads. Leaves opposite, somewhat fleshy (the lower petioled, the upper nearly sessile), 1–2-pinnately parted; the divisions or lobes linear-filiform, canaliculate, entire. Rays light yellow; the disk-flowers purple: the chaff white.

1. *C. filifolium* (Torr. & Gray! l. c.): lower leaves twice ternately or pinnately divided; the upper simply 3–5-divided, or the uppermost simple; the divisions attenuate-filiform; scales of the interior involucre with broad scarious margins, united nearly to the middle, longer than the linear-subulate exterior scales; rays obovate, 3-toothed; achenia crowned with 2 triangular-subulate concave at length divaricate short awns or teeth.—*Nutt.! l. c.* Coreopsis filifolia, *Hook.! bot. mag. t.* 3505; *DC.! prodr.* 7. *p.* 290.

Plains of Arkansas, on the Red River, &c., *Nuttall! Dr. Leavenworth! Dr. Engelmann!* Texas, *Drummond!* May–July.—① *Hook.* 2| *Nutt.* Stem 1–3 feet high, much branched. Heads nearly as large as in Coreopsis tinctoria. Achenia about 3 lines long, crustaceous when ripe, one or both sides smooth and even when young: the awns or teeth scarcely a line in length, fringed with yellow reflexed bristly hairs, apparently persistent. Chaff closely investing the back of the achenia.—We had provisionally appended this group to Cosmos (not to Coreopsis, as Mr. Nuttall by some misapprehension states), to which it is most allied, notwithstanding the yellow rays (which are also found in C. sulphureus) and erostrate achenia.

2. *C. gracile* (Torr. & Gray! l. c.): leaves pinnately or pedately about 5-parted, with narrowly linear rigid lobes; the uppermost nearly simple;

scales of the inner involucre united above the middle, obtuse, without scarious margins, the exterior ovate, obtuse, very short; rays none; ovaries oblong-linear, crowned with 2 subulate retrorsely pectinate-hispid (deciduous?) awns.—Bidens gracilis, *Torr.! in ann. lyc. New York*, 2. *p.* 215.

Upper Arkansas, on the Canadian River, *Dr. James!*—♃ Stems 2 feet high, branched from the base, dichotomous and naked at the summit, striate. Chaff &c. as in the preceding. Awns stout, concave, about the length of the tube of the corolla.—The single specimen brought by Dr. James, the only one extant, is not very perfect. Perhaps it sometimes bears ray-flowers.

104. BIDENS. *Linn.; Gærtn. fr. t.* 167; *DC. prodr.* 5. *p.* 593.

Heads many-flowered; the ray-flowers (3–8) neutral, often inconspicuous or wanting; those of the disk tubular, perfect. Involucre double; the scales dissimilar or nearly similar, the exterior frequently large and foliaceous. Receptacle flattish; the chaff deciduous with the fruit. Corolla with a slender tube, and an infundibuliform-campanulate 5-toothed limb. Branches of the style hairy at the summit, terminated by an acute or subulate cone. Achenia obcompressed, or slender and more or less 4-sided, often attenuate or rostrate at the summit, crowned with 2–4 (rarely 5–6) rigid and persistent retrorsely barbed or hispid awns.—Annual or sometimes perennial (mostly American) herbs; with opposite, incised, serrate, or divided leaves, feather-veined (the numerous primary veins often running to the sinuses) and reticulated. Flowers mostly yellow or yellowish: the anthers pale or brownish.

§ 1. *Achenia flat, oval or cuneiform, not attenuated at the summit; the margins usually ciliate or hispid mostly in a downward direction.*—PLATYCARPÆA, *DC.*

1. *B. frondosa* (Linn.): glabrous or slightly hairy; lower leaves pinnately 5-, the upper commonly 3-divided; the divisions distinct and mostly petiolulate, lanceolate, or the terminal one ovate-lanceolate, acuminate, coarsely serrate (rarely 3-lobed or parted); heads discoid, pedicellate; scales of the exterior foliaceous involucre longer than the head, mostly acute, conspicuously ciliate towards the base; achenia obovate-cuneiform, 2-awned, pubescent and ciliate with chiefly erect hairs.—*Linn.! spec.* (*ed.* 2) 2. *p.* 1166; *Michx.! fl.* 2. *p.* 136; *Willd.! spec.* 3. *p.* 1718; *Pursh, l. c.*; *Ell. sk.* 2. *p.* 431; *Hook. fl. Bor.-Am.* 1. *p.* 314; *Bigel. fl. Bost. ed.* 2. *p.* 294; *Darlingt.! fl. Cest. p.* 486; *DC.! l. c.*

Moist fertile soil, throughout Canada! and the United States! abounding around barn-yards and moist corn-fields, where it is a very troublesome weed. July–Sept.—Stem 2–6 feet high, branched. Petioles, and often the lower surface of the leaves, a little hairy. Scales of the outer involucre 8–12, varying from twice to six times the length of the disk; the inner ovate-lanceolate, brownish. Flowers greenish-yellow. Margins of the achenia upwardly ciliate, except near the summit, where the bristles are usually retrorse.—*Stick-tight. Burr-Marigold.*

2. *B. connata* (Muhl.): glabrous; leaves lanceolate or oblong-lanceolate, acute or acuminate, sharply serrate, tapering into margined petioles, slightly connate at the base; the lower ones often ternately divided; the lateral seg-

ments connate at the base and decurrent on the petiole; heads discoid, mostly on short pedicels; scales of the exterior foliaceous involucre longer than the head, lanceolate or oblanceolate, mostly obtuse, scarcely if at all ciliate; achenia narrowly cuneiform, glabrous, with retrorsely ciliate-hispid margins, 2–4-(commonly 3-) awned.—*Muhl. in Willd.! spec.* 3. *p.* 1718 (& *herb.!*); *Pursh, l. c.; Ell. sk.* 2. *p.* 430; *Hook.! l. c.; DC.! prodr.* 5. *p.* 594. B. cernua, *Darlingt.! fl. Cest. ed.* 1. *p.* 92. B. tripartita, *Bigel. fl. Bost. ed.* 2. *p.* 294. B. petiolata, *Nutt.! in jour. acad. Philad.* 7. *p.* 99; *Darlingt.! fl. Cest. ed.* 2. *p.* 486.

Swampy grounds, and margins of ponds, Canada and throughout the Northern States! to Ohio! Kentucky! Missouri! and the western part of Georgia. July–Sept.—① Stem 10–24 inches high, branched. Leaves very smooth, thin and membranaceous when young, mostly conspicuously acuminate at each end, frequently all undivided. Exterior involucre variable in size, sometimes 1–1½ inch long; the inner membranaceous, brown with a yellowish scarious margin. Flowers greenish-yellow; the rays generally, if not always wanting.—De Candolle has mistaken Hooker's meaning, who, in stating that the leaves are sometimes ternate, does not mean ternately verticillate. This species is introduced into Dr. Short's Catalogue of Kentucky plants under the name of Bidens comosa, *Hooker*, but we are not aware that Sir Wm. Hooker, or any other author, has published a species with this name. In the account of Drummond's Collections in the United States, however, a 'Bidens comata, *Linn.*' is enumerated; but as Linnæus has no such species, we suppose B. connata, *Muhl.* to be intended.

3. *B. cernua* (Linn.): glabrous, or often hairy towards the summit; leaves undivided, lanceolate, unequally serrate, the upper ones slightly connate; heads (discoid or radiate) nodding; exterior involucre longer than the head; achenia obovate-cuneiform, 4-awned, the margin retrorsely ciliate-hispid.—*Linn.! spec.* 2. *p.* 832 (var. discoidea); *Engl. bot. t.* 1114; *Schkuhr, handb. t.* 235; *Koch, fl. Germ. & Helv. p.* 356; *Hook. fl. Bor.-Am.* 1. *p.* 314; *DC.! prodr.* 5. *p.* 595. B. minima, *Linn. spec.* (*ed.* 2) 2. *p.* 1165; *Fl. Dan. t.* 312. Coreopsis Bidens, *Linn. spec.* 2. *p.* 908. (var. radiata.)

β. elata: upper part of the (stout) stem and branches somewhat hirsute with short white hairs; leaves oblong-lanceolate, unequally and incisely serrate; rays inconspicuous.—B. chrysanthemoides, *Hook.! fl. Bor.-Am.* 1. *p.* 314 (excl. syn.), & *bot. Beechey, p.* 148*!* B. quadriaristata, *β.* dentata, *Nutt. in trans. Amer. phil. soc. l. c. p.* 368.

Swamps and ditches, Canada and Saskatchawan, *Hooker*, to Pennsylvania, *Pursh*. Maine and Massachusetts, *Mr. Oakes!* Western part of the State of New York, *Dr. Sartwell!* *β.* Oregon at Fort Vancouver, and Straits of Da Fuca, *Douglas, Dr. Scouler! Nuttall.* (California, *Beechey?*) —① This species is said to be common in Canada, but in the United States it is probably only to be found along the northern borders. The following species approaches its radiate forms too closely; but in B. cernua, the leaves are more irregularly serrate, scarcely connate, and the outer involucre nearly similar to the leaves, and much longer than the rays when these are present. The Oregon plant is certainly much nearer this than the following species.

4. *B. chrysanthemoides* (Michx.): glabrous; stem erect or reclined at the base; leaves lanceolate, tapering to each end, more or less connate, regularly and rather remotely serrate; heads conspicuously radiate, erect or nodding; scales of the foliaceous exterior involucre somewhat unequal, obtuse, ciliate-serrulate towards the base, mostly shorter than the rays; the interior oblong-ovate, membranaceous, partly colored; achenia cuneiform, with retrorsely aculeolate-ciliate margins; awns 2, 3, or 4.—*Michx.! fl.* 2. *p.* 136; *Willd.! spec.* 3. *p.* 1717; *Pursh! fl.* 2. *p.* 566. Coreopsis Bidens,

Walt. Car. p. 215. C. perfoliata, *Walt. l. c.?* Helianthus lævis, *Linn.! spec.* 2. *p.* 906 (*pl. Gronov.!*), not of *ed.* 2.

α. achenia 2-awned, sometimes with two other rudimentary awns; rays about twice the length of the inner involucre.—B. chrysanthemoides, *Michx.! l. c.* (wholly!); *Ell. sk.* 2. *p.* 430; *DC.! prodr.* 5. *p.* 595.

β. achenia 2-awned; rays 2–3 times the length of the inner (colored) involucre; exterior involucre not ciliate; leaves remotely serrulate, scarcely acute.

γ. achenia 3–4-awned: rays 2–4 times the length of the inner involucre.—B. chrysanthemoides, *Bigel.! fl. Bost. ed.* 2. *p.* 294; *Darlingt.! fl. Cest. p.* 485. B. quadriaristata, *DC.! l. c.*

δ. achenia 4-awned; rays scarcely longer than the inner involucre, often exceeded by the exterior.

Swamps, and margin of shallow pools, Canada! and nearly throughout the United States! (*β.* Western Louisiana, *Dr. Hale!*) Aug.–Nov.—①! Stem 6–30 inches high, branching, rarely a little scabrous or hairy at the summit. Leaves 3–6 inches long, serrate with even acute or mucronulate teeth, often minutely ciliate-scabrous towards the base. Rays golden yellow, usually large (about an inch long) and very showy. Chaff spatulate-linear, scarious, about 3-nerved, colored (yellow or purplish) at the summit.—*Beggar-Ticks.*—The number of awns seems to be constant in each individual, but certainly does not furnish specific distinctions. A specimen sent by the elder Richard to Willdenow (probably collected by Michaux), presents 4-awned achenia. Our var. *δ.* is a mere state of var. *γ.*, and nearly approaches B. cernua.

5. *B. Beckii* (Torr.): glabrous; stem elongated, simple or sparingly branched; leaves chiefly submersed, sessile, many times dissected into capillary segments; the emersed ones few, lanceolate, slightly connate, sharply serrate or incised; heads solitary on short terminal peduncles: scales of the exterior involucre usually 5, oval or oblong, obtuse, shorter than the interior and somewhat resembling them, several times shorter than the oblong rays; achenia (immature) narrowly oblong, flattened, perfectly glabrous, 4- (sometimes 6-) awned; the awns approximate in pairs, densely hispid above, glabrous near the base.—*Torr.! in Spreng. neu. entd.* 2. *p.* 135, & *syst.* 3. *p.* 455; *Beck.! bot. p.* 207; *DC.! prodr.* 5. *p.* 595.

In lakes and ponds, and slow-flowing streams, near Schenectady! and in several localities throughout the western part of the State of New York! Massachusetts and Vermont, *Mr. Oakes!* Near Montreal, *Mr. Goldie.* Aug.–Sept.—Plant with the habit and submersed foliage of Ranunculus aquatilis, except that the leaves are opposite: the lowest emersed leaves often 1–2-pinnatifid. Scales of the inner involucre oblong-lanceolate, yellowish, with brown stripes. Rays golden yellow, 8–10 lines long. Anthers pale. Branches of the style terminated by a densely hairy rather acutely conical appendage. Awns usually unequal; the longer nearly twice the length of the half-grown achenium.

§ 2. *Achenia linear-tetragonal, attenuate or rostrate, glabrous or upwardly hairy.*—PSILOCARPÆA, DC. (Kerneria, *Manch.*)

6. *B. leucantha* (Willd.): stem glabrous, somewhat 4-angled; leaves nearly glabrous, petioled, pinnately 3–5-, the upper ones 3-divided; the divisions ovate or ovate-lanceolate, acute, sharply and closely serrate, sometimes confluent; heads (small) paniculate-corymbose, pedicellate; scales of the involucre nearly equal, united at the base; the exterior narrower and ciliate, obtuse; the interior lanceolate, acute, somewhat scarious and colored, rather shorter than the disk; rays small, white; achenia somewhat quadrangular,

linear, glabrous or slightly hairy, 2–4-awned.—*Willd. spec.* 3. *p.* 1719; *DC. prodr.* 5. *p.* 598. Coreopsis leucantha, *Linn. spec.* (*ed.* 2) 2. *p.* 1282. C. coronata, *Linn. l. c.*, excl. *hab.*

Tampa Bay, Florida, *Dr. Leavenworth!* Key West, *Mr. Blodgett!*—① A native also of Mexico, the West Indies, &c.

7. *B. Californica* (DC.): stem 4-angled, somewhat pubescent at the summit; leaves slightly hairy, petioled; the lower pinnately 5-, the upper 3-divided or parted; the divisions ovate, acute or acuminate, incisely serrate; heads discoid, or with a few small rays, pedicellate, somewhat paniculate; scales of the involucre nearly equal, lanceolate; the exterior ciliate, spreading, all at length reflexed; achenia linear, slender, 4-angled, minutely and sparsely hairy towards the summit, 3–4-awned.—*DC.! prodr.* 5. *p.* 599; *Nutt. in trans. Amer. phil. soc. l. c.*

California, *Douglas! Nuttall.*—① Plant ascending, scarcely a foot high. Heads small. Achenia about 4 lines long, sometimes minutely tuberculate-scabrous. Rays white, or yellowish according to Nuttall; who states that the plant is also a native of Chili.

8. *B. bipinnata* (Linn.): glabrous; stem quadrangular, striate; leaves petioled, 1–3-pinnately parted; the segments lanceolate or oblong-ovate, mucronulate, usually narrowed at the base; heads (small) on naked slender pedicels, with 3–4 inconspicuous rays scarcely longer than the disk; exterior scales of the involucre linear, spreading, about the length of the narrowly lanceolate interior ones; achenia linear, elongated and slender, 4-angled and grooved, nearly glabrous, 3–4-awned.—*Linn.! spec.* 2. *p.* 832; *Michx.! fl.* 2. *p.* 135; *Willd.! l. c.*; *Ell. sk.* 2. *p.* 432; *Darlingt.! fl. Cest. p.* 487; *DC.! prodr.* 5. *p.* 603.

Dry soil, and in waste places, Connecticut! New York! and Pennsylvania! to Arkansas! and Florida! (Key West, *Mr. Blodgett!*) July–Oct. ← ① Stem 1–4 feet high, slender, branched. Rays yellow, obovate: disk-flowers yellow, about 20. Achenia three-fourths of an inch in length.—*Spanish Needles.*

B. pilosa (Linn.) is not a native of North America, nor is it said to be by Linnæus, except originally in the *Hortus Cliffortianus*; where the vars. *β.* & *γ.* are said to come from Virginia, &c. But all the synonyms of *β.* there enumerated (except *Dill. Elth. t.* 43. *f.* 5–10, which belong to a broad-fruited species) are in the *Species Plantarum* justly referred to B. bipinnata; and those of var. *γ.*, which we have not the means of tracing further, are equally rejected from the species. B. pilosa is again given as a North American plant by Willdenow, and afterwards by Pursh. who terms it a common weed in old fields and cultivated grounds, from Pennsylvania to Carolina; but the plant in Pursh's view (and also Elliott's?) is doubtless B. frondosa.

Div. 5. VERBESINEÆ, *Less.*, *DC.*—Rays pistillate and fertile, ligulate, rarely none. Achenia compressed or obcompressed, the exterior integument thin. Pappus awned from the angles of the achenium, sometimes with intermediate chaffy scales or teeth, frequently wanting.

105. LEPTOSYNE. *DC. prodr.* 5. *p.* 531.

Head many-flowered; the ray-flowers 10–15, broadly ligulate; those of the disk tubular, perfect. Involucre double, each series of 6–8 scales, as long as the disk; the exterior linear, foliaceous, loose; the interior elliptical,

somewhat membranaceous. Receptacle convex; the chaff membranaceous, 3-nerved, deciduous with the fruit. Rays oblong, coarsely 3-toothed, the base abruptly narrowed into a short slender tube, which is sparsely barbellate at the summit. Corolla of the disk with a slender tube, which is furnished with a bearded ring at the summit, and an obconical throat, deeply 5-toothed. Anthers pale. Branches of the style in the ray-flowers scarcely exserted, obtuse; in the disk somewhat capitellate at the apex, and terminated by a very short and abrupt pointed cone. Achenia oval, obcompressed, slightly incurved when mature, sparsely scabrous with short capitate gland-like hairs, surrounded by a narrow, at length somewhat fungous-thickened wing-like margin, 1-nerved on the inside, crowned with a minute and entire coroniform or cup-shaped pappus.—An annual (biennial, *Nutt.*) glabrous very slender herb, branching from the base; the scapes or peduncles (8–12 inches long) naked, bearing a single head. Leaves alternate, nearly all at the base of the stem, linear-filiform, entire, or sparingly pinnately parted. Ray and disk yellow.

L. Douglasii (DC.! l. c.)—*Hook. & Arn.! bot. Beechey, suppl. p.* 352. L. Californica, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 363.

California, *Douglas!* (in flower only) *Nuttall!* May–June.—Head, including the rays, three-fourths of an inch in diameter.—Instead of having the disk-flowers sterile, as described from immature specimens by De Candolle, and Hooker & Arnott, these alone ripen their fruit according to Nuttall; but we find perfect achenia both in the disk and ray. We place the genus as near as possible to Coreopsis, and next to Chrysanthellum in Verbesineæ.

106. TUCKERMANNIA. *Nutt. in trans. Amer. phil. soc. l. c.*

Head many-flowered; the ray-flowers 15–20, ligulate; those of the disk tubular, perfect. Involucre double; the scales ovate or oval, all slightly united at the base; the exterior 6–8, shorter than the disk, herbaceous; the interior 8–10, membranaceous, somewhat colored (yellowish). Receptacle flat; the chaff membranaceous and scarious, minutely nerved, linear-lanceolate, flat, apparently deciduous. Corolla of the disk with a slender tube, which at the summit is furnished with a naked or obscurely barbellate ring (as in Leptosyne, except that the jointed hairs are few and short or nearly wanting); the throat narrowly obconical, 5-toothed. Branches of the style in the disk-flowers slender, somewhat capitellate at the apex, and terminated by an obscure or extremely short cone. Achenia elliptical, obcompressed, smooth, surrounded by a narrow wing or margin, entirely destitute of pappus.—A somewhat succulent perennial glabrous herb: the alternate or scattered bipinnately-divided leaves with linear entire segments, nearly all borne towards the base of the stem; which terminates in a naked peduncle (a foot long), bearing a very showy head, more than two inches (or even 3–4 inches, ex *Nutt.*) in diameter. Flowers golden yellow.

T. maritima (Nutt.! l. c.)

St. Diego, California, on shelving rocks near the sea, *Nuttall!* May.—

"After the period of flowering, it remains for a month or two in a dormant state, shedding its leaves. . . . Cultivated in Philadelphia, it flowered both in the spring and autumn." *Nutt.*—We trust the plant will not be lost to our gardens, as it is very showy. It is very closely allied to Leptosyne, and, like that plant, has nearly the style of the Anthemideæ.

107. SPILANTHES. *Jacq. stirp. Amer. p.* 214, *t.* 126; *DC. l. c.*

Spilanthus, *Linn. mant.; Gærtn.; Less. &c.*—Spilanthes & Acmella, *Richard.*

Heads many-flowered; the ray-flowers ligulate, sometimes inconspicuous, or frequently wanting. Involucre shorter than the disk, appressed, in 2 series; the exterior scales somewhat foliaceous; the interior membranaceous. Receptacle conical, convex, or elongated; the chaff membranaceous, embracing the flowers. Corolla of the disk tubular-infundibuliform, 4–5-toothed. Branches of the style in the disk-flowers truncate and penicillate at the summit. Achenia of the disk laterally compressed, the margins mostly ciliate; of the ray, when present, somewhat triquetrous, or by the obliteration of the inner angle more or less obcompressed; all either crowned with 1–3 small setiform awns, or naked.—Mostly annual tropical herbs (the greater portion American), usually fervid or acrid to the taste; with opposite entire or serrate leaves. Heads solitary on slender peduncles, ovate or conical. Flowers yellow or rarely white. Anthers blackish.

§ *Heads radiate; the rays hairy at the base: achenia of the ray either 3-angled and 3-awned or sometimes awnless, or 2-awned, the inner angle naked, or sometimes the inner angle obliterated.*—ACMELLA, (Rich.) DC.

1. *S. repens* (Michx.): glabrous, or sparsely somewhat hairy; stem simple or slightly branched, decumbent, rooting at the base; leaves lanceolate or ovate-lanceolate, acute, somewhat serrate, mostly tapering into a petiole; peduncles terminal (or at length alar), elongated; heads ovoid; scales of the involucre lanceolate, about 12, in 2 series; rays 12, exserted; achenia awnless and without ciliate margins.—*Michx.! fl.* 2. *p.* 131; *DC. prodr.* 5. *p.* 623. Acmella repens, *Pers.; Ell. sk.* 2. *p.* 406. Anthemis repens, *Walt.; Pursh, fl.* 2. *p.* 562.

In wet or inundated places, South Carolina to Florida! Sept.–Oct.—*4* Disk and ray yellow; the former at length oblong-conical. Achenia slightly papillose-scabrous when mature; the exterior often with ciliate margins. —We have a specimen from a plant cultivated in the *Jardin des Plantes* under this name, which accords with the description as to the foliage; but the short involucral scales are ovate, and the achenia all strongly ciliate.

2. *S. Nuttallii:* villous-pubescent, or nearly glabrous; stems diffusely branched, ascending; leaves ovate or oblong, acute, coarsely serrate-toothed, abruptly contracted into a slender petiole; heads ovoid, at length conoid-oblong, on terminal or alar peduncles longer than the leaves; scales of the involucre lanceolate-ovate, acute, 9–12, somewhat in a double series; rays 5?–12, mostly as long as the disk; achenia awnless (rarely with 1 or 2 very minute awns), tuberculate-scabrous when mature, the margins ciliate.—Acmella occidentalis? *Nutt.! gen.* 2. *p.* 171, not of *Pers.*

Inundated places, East Florida! (*Dr. Leavenworth!*) to Louisiana! Mis-

sippi! Arkansas! and Texas! Aug.–Oct.—Stems 1–2 feet long. Leaves 2 inches or more in length, one or more wide, veiny. Rays yellow, varying from a fourth to fully half an inch in length, usually 10 or 12. Disk when mature fully half an inch long. Achenia of the ray somewhat triangular-obcompressed, otherwise similar to those of the disk; the innermost often smooth, at least when young; but all distinctly, although not very stongly ciliate.

S. Pseudo-Acmella (Linn.) is cited as a Californian species, with a mark of doubt, in the Botany of Beechey's Voyage (p. 150), on the authority of a very imperfect specimen in the collection from California, made during that voyage.

108. LIPOCHÆTA. *DC. prodr.* 5. *p.* 610.

Heads many-flowered; the ray-flowers ligulate, in a single series. Involucre ovate or campanulate; the scales oval, appressed, in 2–3 series. Receptacle flattish; the chaff membranaceous, clasping the flowers. Branches of the style in the disk-flowers appendiculate at the summit. Achenia of the ray 3-sided, scarcely or somewhat winged, each angle produced into a persistent awn, and with a few setiform [or chaffy] teeth between the awns; of the disk compressed, 1–2-awned, the inner margin slightly winged.—Suffruticose or herbaceous plants [chiefly natives of Mexico and the Sandwich Islands], with the habit of the opposite-leaved Verbesinæ. Leaves opposite, sessile, or on short petioles, ovate-lanceolate, somewhat serrate, triplinerved. Heads pedicellate, either solitary or corymbose. Flowers yellow. *DC.*

§ *Achenia of the ray* 3-, *of the disk mostly* 2-*awned* (*the awns slender and upwardly scabrous*), *with a few intermediate chaffy teeth or scales, more or less united with each other and with the base of the awns.*—CATOMENIA.

1. *L. Texana:* suffruticose; branches terete; leaves sessile, triplinerved, rhombic-ovate, the uppermost ovate-lanceolate, rather acute, strigose above, villous-hirsute beneath, sparingly and remotely serrate, mostly 2-angled or 2-lobed near the middle, cuneiform at the base; peduncles solitary, naked, slender; scales of the canescent campanulate involucre in 2 series, nearly equal in length; the exterior lanceolate, somewhat foliaceous; the interior with scarious margins; ovaries narrow, crowned with 2–3 setiform awns, and a few short hyaline denticulate-lacerate scales, all more or less united at the base.

Texas, *Dr. Riddell!*—Plant hairy and scabrous; the young branches, lower surface of the leaves, peduncles, &c. somewhat canescent with appressed hairs. Leaves 1–2 inches long, slightly hastate-lobed or angled; the scabrous hairs of the upper surface arising from impressed tubercles. Involucre about the length of the disk, appressed. Rays 7 or 8, narrowly oblong, minutely 3-toothed at the summit, 5–6 lines long, orange-yellow in the dried state. Corolla of the disk yellow, with a slender tube, and an elongated slightly dilated 5-toothed limb; the teeth puberulent externally. Anthers brownish, tipped with yellowish triangular appendages. Branches of the style (in the disk) terminated with long and acute linear-subulate hirsute appendages. Ovaries of the ray triangular, somewhat pubescent; of the

disk pubescent, oblong-linear, compressed; the awns in the latter 2, sometimes 1 or 3, rather shorter than the corolla; in the former 3, often unequal, shorter than those of the disk. Mature achenia unknown.—Apparently allied to L. strigosa, *DC.*

109. VERBESINA. *Linn.* (partly); *Less. syn. p.* 231; *DC. prodr.*

Species of Verbesina & Siegesbeckia, *Linn.*

Heads several–many-flowered; the ray-flowers ligulate, usually few, rarely wanting. Scales of the involucre erect, imbricated in two or more often unequal series. Receptacle flat or rather convex; the chaff concave or embracing the flowers. Corolla of the disk with a short tube, and a cylindraceous 5-toothed limb. Branches of the style with an acute appendage. Achenia nearly flat (compressed laterally) winged or wingless, 2-awned.—Perennial or suffrutescent (American) plants; the serrate or lobed leaves often decurrent on the stem. Heads solitary or corymbose. Flowers white or yellow. Anthers blackish.

§ *Heads radiate; the rays in a single series: achenia usually with 2 similar and equal awns.*—VERBESINARIA, DC.

* *Leaves opposite: flowers of the disk and ray yellow.*

1. *V. Siegesbeckia* (Michx.): stem 4-winged; leaves ovate or ovate-lanceolate, sharply serrate, acuminate at both ends, triplinerved; heads in trichotomous somewhat cymose corymbs; scales of the involucre few (8–10) and obtuse, in 2 series; rays 1–5, lanceolate; achenia obovate-oblong, wingless, hairy, 2-awned; those of the ray rarely 1-awned or awnless.—*Michx.! fl.* 2. *p.* 134; *Willd. spec.* 3. *p.* 2224; *Pursh, fl.* 2. *p.* 565; *Ell. sk.* 2. *p.* 412. V. Phæthusa & Siegesbeckia, *DC. prodr.* 5. *p.* 616? V. occidentalis, *Walt. Car. p.* 213. V. foliis ovatis petiolatis, &c., *Gronov.! fl. Virg. ed.* 1. *p.* 179. Siegesbeckia occidentalis, *Linn.! spec.* 2. *p.* 901, & *ed.* 2. *p.* 1269. Chrysanthemum Americanum caule alato, &c., *Pluk. mant. t.* 342. Phæthusa Americana, *Gærtn. fr.* 2. *p.* 425, *t.* 169, *f.* 3? P. borealis, *Spreng. syst.* 3. *p.* 591? Coreopsis alata, *Pursh, fl.* 2. *p.* 567; and therefore Actinomeris alata, *Nutt. gen.* 2. *p.* 181.

Dry woods and road-sides, very common in the Southern and Western States! Aug.–Sept.—Stem 4–6 feet high. Leaves large, membranaceous, often pubescent, especially beneath, abruptly tapering into a margined petiole. Rays 8–10 lines long; those of the disk about 20 in number: the tube of the corolla in both pubescent. Chaff lanceolate, acute, nearly as long as the disk. Awns of the achenia slender, often divergent or recurved when old.—The plant we have described is certainly the Siegesbeckia occidentalis of Linnæus and Gronovius, and is the only North American species with opposite leaves that we have seen: the leaves appear to be always triplinerved; but the uppermost often indistinctly so. We are doubtful whether it be the Phæthusa of Gærtner, which seems however to differ only in wanting the awns: these are sometimes absent in the ray of our plant, and the short bristly hairs of the achenium, some of which crown the summit, accord very well with Gærtner's and De Candolle's description, although they have nothing to do with the pappus. The plant, according to De Candolle, is somewhat diœcious in cultivation.

* * *Leaves alternate: flowers of the disk and ray white.*

2. *V. Virginica* (Linn.): stem narrowly or interruptedly winged, tomentose-pubescent at the summit; leaves lanceolate or ovate-lanceolate, serrate (often obscurely), feather-veined, scabrous above, pubescent or tomentose beneath, acute or acuminate at each end, the lower ones decurrent; heads in compound cymose corymbs, crowded; rays 3–4, oval; achenia minutely hairy, narrowly and often unequally winged, crowned with 2 scabrous setiform awns.—*Linn.! spec.* 2. *p.* 901 (*pl. Gronov.!*); *Walt.! Car. p.* 213; *Michx.! fl.* 2. *p.* 134; *Pursh, l. c.*; *Ell. sk.* 2. *p.* 410; *DC.! l. c.* V. paniculata, *Poir. dict.* 8. *p.* 456.

β. stem and lower surface of the leaves more tomentose; achenia sometimes wingless.—V. villosa, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 370.

Woods and dry soil, Pennsylvania (*Michaux*) and Virginia! to Florida! and Louisiana! *β.* Kentucky! to Arkansas! and Louisiana! Aug.–Sept. —Stem 3–6 feet high. Involucre very pubescent. Rays very short: the tube hairy, as also the (about 15) disk-flowers.—The wings of the achenia are variable, even in the same individual, as in Actinomeris; and are sometimes nearly absent in the smoothish as well as the most tomentose forms.

3. *V. sinuata* (Ell.): stem striate, pubescent, naked, or sometimes winged near the base; leaves irregularly sinuate-lobed or laciniate-pinnatifid, scabrous above, tomentose-pubescent beneath, the lower ones tapering into a long and narrow base or winged petiole; the lobes denticulate or serrate; heads in a compound corymb; rays 3–5, oval; achenia minutely hairy, 2-awned, narrowly winged.—*Ell.! sk.* 2. *p.* 411; *DC. prodr.* 5. *p.* 615. V. laciniata, *Nutt.! gen.* 2. *p.* 170. Siegesbeckia laciniata, *Poir. dict.* 7. *p.* 158 *?*

Sandy soil, from the sea-coast of S. Carolina! to Florida, *Dr. Burrows! Dr. Leavenworth!* Sept.–Nov.—Stem 4–6 feet high. Leaves mostly acute or acuminate, variously sinuate-pinnatifid; the uppermost and lowest frequently spatulate-ovate and undivided, according to Elliott. Heads, flowers &c., nearly as in V. Virginica; of which perhaps it is only a variety.

V. laciniata (Walt.), is said to have 3–9 yellow 2–3-toothed *sterile* rays, 3-awned achenia, and sinuate-laciniate leaves.

110. XIMENESIA. *Cav. ic.* 2. *p.* 60, *t.* 178: *DC. prodr.* 5. *p.* 627.

Heads many-flowered; the ray-flowers ligulate, in a single series. Scales of the involucre somewhat in 2 series, narrow, acute; foliaceous, spreading. Receptacle convex; the chaff lanceolate, membranaceous, embracing the flowers. Tube of the corolla hispid. Branches of the style in the disk-flowers appendiculate. Achenia of the disk flat (compressed laterally), winged, somewhat hairy, deeply emarginate at the summit, with 2 setiform awns more or less united with the wing; those of the ray mostly dissimilar and wingless.—Annual (chiefly Mexican) somewhat canescent herbs. Leaves opposite or alternate, mostly tapering into a winged petiole, which is dilated and auriculate at the base, cordate-ovate or oblong, serrate-toothed. Heads solitary, or loosely and irregularly corymbose. Flowers yellow.

1. *X. encelioides* (Cav. l. c.): achenia of the disk slightly villous, surrounded with the wing, emarginate at the summit; of the deeply 3-toothed

rays rugose, wingless. *DC.! prodr. l. c.* Pallasia serratifolia, *Smith, in Rees, cycl.*

Florida, *Dr. Chapman! Mr. Croom!* Probably introduced.

New Mexico

111. SANVITALIA. *Gualt. in Lam. jour. hist. nat.* 2. *p.* 176, *t.* 33, & *ill. t.* 686; *Cav. ic.* 4. *t.* 351; *DC. prodr.* 5. *p.* 628.

Heads many-flowered; the ray-flowers ligulate, in a single series, the ligules persistent. Scales of the involucre somewhat imbricated in 2-3 series, appressed; the innermost rather longer and equalling the disk. Receptacle conical or convex, chaffy; the chaff oblong, partly clasping the flowers. "Corolla of the disk articulated above the ovary, piliferous," *DC.* Branches of the style terminated by a short cone. Achenia of the ray, larger, 3-sided, smooth, crowned with 3 diverging smooth conical awns; of the disk compressed; the exterior ones muricate or roughened and nearly awnless; the interior more or less winged and ciliate, crowned with 2 minute awns.—Annual (chiefly Mexican) dichotomous or trichotomous mostly hairy herbs. Leaves opposite, ovate, triplinerved, usually entire, tapering into a ciliate or hairy petiole. Heads solitary and terminal, sessile between the uppermost pair of leaves. Rays yellow: the disk purplish.

1. *S. ocymoides* (DC.): stem diffuse, rather erect; leaves ovate; awns of the ray longer than the ligules; achenia of the disk compressed-tetragonal; the exterior muricate, wingless, slightly 2-awned; the interior smoother, somewhat winged, with rather longer awns. *DC.! l. c.*

Texas, *Berlandier!*—Leaves, including the ciliate petioles, about an inch long, strigose. Plant with wholly the habit of S. procumbens.

Subtribe 3. FLAVERIEÆ, *Less.*—Heads 1–few-flowered, densely aggregated, heterogamous with a single pistillate ray-flower, the others perfect; or sometimes homogamous (rarely with the pistillate flowers in several series, when the innermost are perfect but sterile). Branches of the style usually not appendiculate. Receptacle naked, except when the head is many-flowered. Achenia wingless, somewhat terete, attenuate at the base. Pappus none.—Herbs, with opposite triplinerved or nervose leaves. Flowers yellow.

112. FLAVERIA. *Juss. gen. p.* 168; *DC. prodr.* 5. *p.* 635.

Heads in glomerate fascicles, few-flowered, either discoid, the flowers all tubular and perfect, or with a single pistillate ray-flower. Involucre oblong, of 3–4 connivent nearly equal scales, the outermost broader and somewhat concave. Receptacle small, naked. Achenia oblong or subclavate, striate, glabrous, naked.—Annual or rarely perennial (tropical and South American) herbs; with opposite mostly sessile leaves, toothed or entire. Corolla pale yellow.

1. *F. linearis* (Lagasca): suffruticose at the base, somewhat procumbent,

glabrous or slightly pubescent; leaves sessile, connate, narrowly linear, entire, nearly nerveless, somewhat fleshy; heads in compound crowded corymbs; ray single or often wanting.—*Lag. nov. gen. &c. p.* 33; *DC. l. c.* F. maritima, *H. B. & K.! nov. gen. & spec.* 4. *p.* 285. F. tenuifolia, *Nutt.! in jour. acad. Philad.* 7. *p.* 81. Selloa nudata, *Nutt.! in Sill. jour.* 5. *p.* 300; and therefore Gymnosperma nudatum, *DC. prodr.* 5. *p.* 312.

East Florida, *Mr. Ware! Mr. Peale!* Key West, *Mr. Bennett! Mr. Blodgett!*—A maritime species, also a native of Cuba.

Subtribe 4. TAGETINEÆ, *Cass.*—Heads many-flowered, either heterogamous, with the ray-flowers pistillate and mostly ligulate, or homogamous and discoid. Involucre either in a single series, the scales more or less united; or in several series, the exterior scales bracteiform and distinct, the inner more or less united. Branches of the style terminated by a cone or a subulate appendage. Receptacle naked, flat. Achenia striate, attenuate at the base. Pappus composed of awns, squamellæ, or bristles.—Herbs, marked with large glandular pellucid dots, and therefore commonly odorous. Leaves opposite or alternate.

113. DYSODIA. "(Dyssodia) *Car. in ann. sci. nat.* 6. (1802) *p.* 334"; *DC. prodr.* 5. *p.* 639.

Heads radiate or sometimes discoid; the rays ligulate, pistillate. Scales of the proper involucre in a single series and more or less united, usually subtended by an outer series of bracts. Receptacle somewhat alveolate or hirsute-fimbrillate. Corolla of the disk regularly 5-toothed. Branches of the style terminated by a somewhat pubescent cone. Achenia elongated, 4-angled and somewhat compressed. Pappus a single series of chaffy scales, which are pinnately or palmately laciniated or cleft into scabrous bristles, so as to appear like a polyadelphous pappus!—Mostly annual branching (chiefly Mexican) herbs, with the habit of Tagetes. Leaves opposite or alternate, commonly pinnately parted or toothed, the teeth mucronate-setigerous. Heads terminating the paniculate or corymbose branchlets. Flowers yellow or orange.

§ *Receptacle somewhat alveolate, slightly fimbrillate, or naked: involucre bracteolate; the bracts entire or laciniate-pinnatifid.*—BŒBERA, Willd. (1803.) (Dysodia § Bœbera & Bœberoides, *DC.*)

1. *D. tagetoides:* glabrous; stems corymbose at the summit; leaves alternate or rarely opposite, narrowly linear, spinulose-toothed; scales of the cylindrical-oblong involucre united nearly to the summit, longer than the spinulose-toothed or sparingly pinnatifid involucrate bracts; rays numerous (10 or more), exserted; achenia glabrous; pappus much shorter than the corolla; the scales linear-subulate, sparingly laciniate, or sometimes nearly entire.

Texas, *Drummond!* Western Louisiana or Arkansas, *Dr. Leavenworth!*—2l? Stem erect, often branching at the base, about a foot high. Leaves 2 inches long, only a line wide, pinnately laciniate with spinulose teeth. In-

volucre much longer than the pappus, marked with very large dots. Rays linear-oblong, bright yellow.

2. *D. chrysanthemoides* (Lagasca): puberulent or glabrous, diffusely branched; leaves opposite, pinnately parted; the lobes linear, toothed or incised towards the summit; heads terminating the paniculate leafy branchlets; scales of the campanulate involucre united at the base, scarious at the summit; the involuciform bracts (about 8) linear, entire, ciliate at the base; rays few, scarcely exceeding the involucre; achenia pubescent; pappus as long as the involucre, rather longer than the corolla; the scales dissected into numerous slender bristles.—*Lagasca, elench. hort. Madr. p.* 29; *DC.! prodr.* 5. *p.* 640. Dyssodia glandulosa, *Cav. demonst. bot. p.* 202, not of *Less.* Tagetes pappposa, *Vent. hort. Cels. t.* 36; *Michx.! fl.* 2. *p.* 132. Bœbera chrysanthemoides, *Willd.! spec.* 3. *p.* 2125; *Pursh, fl.* 2. *p.* 559. B. glandulosa, *Pers. syn.* 2. *p.* 459.

Banks of rivers, and on prairies, on the Mississippi and Missouri, and their tributaries, from St. Pierre River! and Illinois! to Louisiana! Aug.–Oct. — ① Plant about a foot high, exhaling a very strong unpleasant odor. Flowers golden yellow.—Willdenow gives Carolina and Florida as habitats of this plant, doubtless incorrectly. It is also a Mexican species.

114. RIDDELLIA. *Nytt. in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 371.

Heads many-flowered, radiate; the rays 3–5, ligulate, pistillate, dilated, 6-nerved, equally 3-lobed, persistent; the disk-flowers tubular, perfect. Involucre cylindrical, composed of 8 scales united in a single series. Receptacle small, naked. Corolla of the disk 5-toothed; the teeth glandular. Appendages of the style subcapitate, obtuse, minutely pubescent. Achenia "slender and conic [obconical?], prismatic, smooth." Pappus of the ray and disk similar, of 5–6 lanceolate acuminate nerveless chaffy scales.—A slender branching aromatic herb, with alternate oblong-linear and somewhat tomentose leaves; the branchlets corymbose, bearing 3–5 heads. Rays apparently yellow, turning to reddish-orange. Involucre densely silky with long hairs.

R. tagetina (Nutt. l. c.)

"In the southern range of the Rocky Mountains, towards the sources of the Platte.—A very elegant plant, with the habit of a Zinnia, but having the involucrum formed of a single series of united sepals. The rays are very remarkable, appearing as rigid as parchment, and remain perfectly flat after inflorescence, as in Zinnia." *Nuttall.*—This genus is dedicated to Prof. John L. Riddell, formerly of Ohio, now of New Orleans; author of a *Synopsis of the Flora of the Western States*, published at Cincinnati in 1835 (pp. 116, 8vo.), and of a *Supplementary Catalogue of Ohio Plants* (1836). This plant is unknown to us, and we have taken the character from Mr. Nuttall's memoir. So far as the description extends, it only differs from Tagetes in the persistent rays, and the pubescence. We are not informed whether or not the leaves present the large pellucid dots of the Tagetineæ.

Subtribe 5. Heleniеæ, *Cass., DC.*—Heads mostly heterogamous and radiate; the disk-flowers perfect, but sometimes sterile. Receptacle naked or chaffy. Anthers often blackish, the lobes frequently somewhat produced at

the base, but scarcely caudate. Pappus chaffy, the scarious scales several or numerous, and distinct, or sometimes none.—Leaves alternate or opposite. (Chiefly American.)

CONSPECTUS OF THE GENERA.

Div. 1. GAILLARDIEÆ.—Receptacle not chaffy, nor deeply favose.

Subdiv. 1. EUGAILLARDIEÆ.—Branches of the style long and filiform, hispid.

115. GAILLARDIA. Rays ligulate, neutral. Achenia obpyramidal, involucrate with villous hairs. Pappus 1-nerved and awned.

116. PALAFOXIA. Rays ligulate, pistillate, or none. Achenia mostly slender. Pappus 1-nerved, awnless.

117. CHÆNACTIS. Rays, or exterior disk-flowers tubulose, inflated or palmate. Achenia slender. Pappus nerveless.

Subdiv. 2. EUHELENIEÆ.—Branches of the style obtuse or truncate. 371

* *Rays ligulate and fertile, or none.*

+ Receptacle flat or flattish.

118. HYMENOPAPPUS. Rays none. Achenia turbinate, substipitate, many-striate. Scales of the pappus short and obtuse, 12–20. Involucre somewhat petaloid, spreading.

119. BAHIA. Rays 5–11. Achenia prismatic. Scales of the pappus 4–10, oblong. Involucre appressed.

120. ACTINOLEPIS. Rays 3–5. Achenia terete. Pappus of the disk none, in the ray of 10–15 narrow acute scales.

+ + Receptacle conical, convex, or oblong.

121. LASTHENIA. Scales of the involucre united! Pappus of 5–10 scales, or sometimes none!

122. BURRIELIA. Receptacle conical, papillose. Scales of the pappus equal, narrow, subulate-awned, or sometimes none!

123. DICHÆTA. Receptacle conical, alveolate-toothed. Scales of the pappus 4–8 oblong and obtuse, and about 2, which are subulate-awned.

124. HYMENOXYS. Receptacle conical, alveolate. Scales of the pappus 5–12, oblong or lanceolate, acuminate or awned, rarely obtuse or none! Lobes of the disk-corolla nearly glabrous.

125. ACTINELLA. Receptacle hemispherical or conical, naked. Scales of the involucre ovate or lanceolate, appressed. Lobes of the disk-corolla glandular-bearded. Scales of the pappus 5–12, ovate, 1-nerved, awned.

126. AMBLYOLEPIS. Receptacle flattish, alveolate. Scales of the involucre ovate, appressed. Scales of the pappus 5, obtuse, nerveless.

127. HELENIUM. Receptacle convex or oblong, naked. Scales of the involucre linear or subulate, spreading or reflexed. Lobes of the disk-corolla glandular-bearded. Scales of the pappus 5–8, apiculate or awned.

* * *Rays neutral.*

128. LEPTOPODA. Receptacle conical or hemispherical, areolate. Scales of the pappus mostly nerveless and awnless, denticulate or fimbriate.

388 *Div.* 2. BALDWINIEÆ.—Receptacle very deeply alveolate; the corneous alveoli (united chaff?) enclosing the achenia. Rays neutral.

129. BALDWINIA. Rays 20–30. Involucre in about 4 series. Alveoli of the receptacle truncate. Head solitary.

130. ACTINOSPERMUM. Rays 8–10. Involucre in about 2 series. Alveoli of the receptacle subulate-toothed. Heads corymbose.

390 *Div.* 3. GALINSOGEÆ.—Receptacle chaffy; the chaff distinct. Scales of the involucre not enclosing the ray-achenia.

131. MARSHALLIA. Rays none: disk-flowers numerous. Chaff narrow, rigid. Scales of the pappus ovate or triangular-lanceolate, entire.

132. BLEPHARIPAPPUS. Rays and disk-flowers few. Chaff membranaceous. Scales of the pappus pectinate-plumose.

392 *Div.* 4. MADIEÆ.—Receptacle wholly or partly chaffy. Ray achenia destitute of pappus, enclosed by the scales of the involucre.

* *Achenia not compressed, but often obcompressed.*

+ Heads many-flowered; the rays infertile?

133. ACHYRACHÆNA. Pappus of 10 membranaceous obtuse scales in 2 series, the inner large. Achenia striate, attenuate at the base.

+ + Heads many-flowered; the flowers all (or nearly all) fertile.

134. LAYIA. Pappus of 10–20 bristly awns, villous-plumose towards the base.

135. CALLICHROA. Pappus of 12–25 subulate serrulate-scabrous awns. Disk-achenia somewhat obcompressed, villous.

136. OXYURA. Pappus none. Achenia of the disk and ray glabrous, obovate, obcompressed; the central infertile.

+ + + Heads several–many-flowered; the disk-flowers infertile.

137. HEMIZONIA. Rays 5–20. Achenia glabrous; those of the ray obovoid, gibbous, somewhat obcompressed, partly enclosed by the involucral scales. Pappus none, or of lacerate squamellæ.

138. CALYCADENIA. Rays 3–5. Achenia mostly hairy; of the ray obovoid-triangular, partly enclosed by the involucral scales; of the disk quadrangular-obcompressed, with a pappus of 5–10 lanceolate or subulate often awned scales.

139. LAGOPHYLLA. Rays and disk-flowers each about 5. Achenia glabrous; those of the disk abortive, destitute of pappus; of the ray obcompressed.

* * *Achenia compressed, glabrous. Pappus* (*except in* Anisocarpus) *none.*

140. ANISOCARPUS. Rays about 12: disk-flowers numerous, with abortive ovaries, and a pappus of 5–8 fimbriate-lacerate squamellæ.

141. MADARIA. Rays 10–15: disk-flowers numerous, with abortive ovaries. Receptacle convex, fimbrillate-hirsute.

142. MADIA. Rays 5–12: disk-flowers numerous, fertile. Receptacle glabrous.

143. AMIDA. Rays 1–2, or none; the disk-flowers 2–4, fertile. Achenia compressed–3–4-angular, slightly incurved.

144. HARPÆCARPUS. Rays 5–8; the disk-flower solitary, fertile. Ray-achenia obovate-lunate, flat.

Div. 1. GAILLARDIEÆ, *DC.* (excl. gen.)—Receptacle not chaffy, nor very deeply alveolate. Rays fertile or neutral, or sometimes none.

Subdiv. 1. EUGAILLARDIEÆ.—Branches of the style in the disk-flowers long and filiform (nearly as in Eupatoriaceæ), hispid or glandular-pubescent.

115. GAILLARDIA. *Fougeroux, in mem. acad. sci. Par.* (1786) *p.* 5; *DC. prodr.* 5. *p.* 56; *Gay, in ann. sci. nat.* (*ser.* 2) 11. *p.* 57.

Galardia, *Lam.* (*ill. t.* 708), *Michx., Nutt., & Less.*

Heads many-flowered, radiate; the ray-flowers neutral, in a single series, deciduous. Scales of the involucre in about 3 series, very acute, foliaceous, more or less callous and appressed or erect at the base, above spreading or at length reflexed; the exterior largest. Receptacle convex or hemispherical, fimbrillate (the fimbrillæ rigid or corneous and elongated), or in one species nearly naked. Rays cuneiform, palmately 3-cleft or toothed at the summit. Corolla of the disk with a short tube, and an elongated cylindraceous somewhat inflated 5-toothed limb; the teeth usually subulate, and hispid with jointed hairs. Branches of the style terminated with a very long and acute filiform hispid appendage. Achenia obpyramidal, involucrate with villous hairs. Pappus of 6–10 membranous 1-nerved scales, the nerves produced into awns about the length of the corolla.—Branching (North American) herbs, with the habit of Scabiosa, more or less pubescent with jointed hairs. Leaves alternate, mostly punctate with glandular or pellucid dots, entire, sometimes toothed or lobed; the lower ones often petioled, the upper sessile. Heads on slender naked peduncles terminating the stem or branches. Flowers of the disk violet, or sometimes yellowish. Rays yellow or purple, often 2-colored, dotted with resinous globules, as also the style. Anthers pale yellow.

* *Pappus of the ray-flowers awned like that of the disk.*

1. *G. lanceolata* (Michx.): biennial? puberulent; stem usually branched; the branches elongated; leaves lanceolate or linear, entire or very sparingly serrate or denticulate, ciliolate, mostly obtuse, mucronulate-acuminate; the lower ones somewhat spatulate and slightly petioled, the upper sessile; involucre about the length of the disk, in about 2 series, neither callous nor hirsute at the base; corolla of the disk with long and narrow subulate teeth; chaff of the pappus (7–9) narrowly lanceolate; the fimbrillæ of the receptacle minute abortive teeth, or none!—*Michx.! fl.* 2. *p.* 142; *Gay! in ann. sci. nat. l. c. p.* 63; not of *DC.* G. bicolor, *Pursh, fl.* 2. *p.* 572. (excl. syn. *Fouger., L'Her. &c.*); *Nutt.! gen.* 1. *p.* 175; *Ell.! sk.* 2. *p.* 449; *Hook.! compan. to bot. mag.* 1. *p.* 98. Leysera Caroliniana, *Walt. Car. p.* 211, ex *Pursh*, (perhaps erroneously.)

β. rays abortive or none.—Polypteris integrifolia, *DC.! prodr.* 5. *p.* 659, excl. all the synonymy.

Dry pine woods and barrens, South Carolina! to Florida! Alabama! Louisiana! Arkansas! and Texas! May–Aug.—Root certainly biennial,

and sometimes perennial. Stem 1–2 feet high. Leaves clothed with a minute appressed pubescence; the short hairs which fringe the margin incurved. Involucre often tinged with purple. Heads, including the rays, about an inch in diameter. Rays 8–10, small and distant, cuneiform, narrowed at the base, deeply 3-cleft, yellow throughout, or pale violet beneath or at the base, the nerves often violet. Corolla of the disk, as in the other species, either violet-purple or yellow, at length turning violet at the summit. Receptacle nearly or quite naked, by which the species (the only one in the Atlantic Southern States) may always be distinguished.—We have received the rayless and nearly rayless states from Alabama (*Mr. Buckley!*) and Florida (*Dr. Leavenworth!*), and have seen it in the herbarium of De Candolle. It is also mentioned by Michaux.

2. *G. aristata* (Pursh): perennial, villous-pubescent or almost tomentose; stems simple or branched; radical and lower leaves lanceolate, tapering into slender petioles, sinuate-pinnatifid or toothed (the lobes or teeth 2–4 on each side); the uppermost linear or oblong-lanceolate, sessile, usually dilated at the base and partly clasping; involucre very hirsute and callous at the base, equalling or exceeding the disk; corolla of the disk with short broadly subulate teeth; chaff of the pappus (6–8) broadly lanceolate; fimbrillæ of the receptacle few, aristiform, slender, distinct and not dilated at the base, twice or thrice the length of the achenia.—*Pursh, fl.* 2. *p.* 573; *Lindl. bot. reg. t.* 1186; *Hook. bot. mag. t.* 2940, & *fl. Bor.-Am.!* 1. *p.* 315; *DC.! prodr.* 5. *p.* 652; *Gay! in ann. sci. nat. l. c. p.* 57. G. bicolor, *Sims, bot. mag. t.* 1062 (fide *Gay*); *Hook.! fl. Bor.-Am. l. c.* (excl. syn.) G. bicolor *β.* aristata, *Nutt.! gen.* 2. *p.* 175. G. rustica, *Cass.*; *Desf. cat. hort. Par. ed.* 3, fide *Gay.* G. lanceolata, *DC. l. c.* (excl. syn. *Michx.* & *Ell.*), fide *Gay.*

Plains and prairies, Missouri! and Saskatchawan! to Oregon!—Plant 12–18 inches high; the stems frequently simple. Head 1½–2 inches in diameter. Rays 10–18, crowded, elongated-cuneiform, deep yellow throughout, or sometimes orange or reddish violet at the very base. Achenia scarcely hairy except at the base.—This species presents several forms, which perhaps cannot be limited or defined. That which best accords with Pursh's description (G. aristata, *Hook.! fl. Bor.-Am.*, partly,) has all the upper leaves entire, and the exterior scales of the involucre much longer than the disk: another (G. aristata, *Hook.* Oregon, *Dr. Scouler!*) has a shorter and more woolly involucre; while in the G. bicolor, *Hook. l. c.*, nearly all the lower leaves are frequently sinuate or pinnatifid. Gay's description is excellent, except that we never find the setiform fimbrillæ of the receptacle "nearly as long as the corolla," but sometimes about two-thirds its length: they are few and sparse, so as not to circumscribe the areoleæ, and are somewhat deciduous.

3. *G. pinnatifida* (Torr.): perennial, canescent; stem low, branching; leaves sessile, pinnatifid; the rachis and remote lobes linear; involucre in about 2 series, nearly equal to the disk; chaff of the pappus (7–10) lanceolate, rather shorter than the obtusely 5-toothed corolla; fimbrillæ of the receptacle aristiform, slender, sparse, not dilated at the base, longer than the achenia.—*Torr.! in ann. lyc. New York*, 2. *p.* 214.

Western Arkansas or Missouri, (on the Canadian River?) *Dr. James!*—Plant about a span high, perhaps suffruticose, leafy. Heads rather small. Rays deeply 3-cleft, "purple towards the base, yellow at the summit." The aristate portion of the pappus much shorter than the elongated-lanceolate chaff.

4. *G. pulchella* (Fougeroux): annual, puberulent or slightly hirsute, branching; leaves lanceolate; the lower ones tapering at the base and slightly petioled, somewhat toothed (rarely incised or pinnately lobed); the upper entire, partly clasping, apiculate-acuminate; involucre very hirsute

and callous at the base, longer than the disk; corolla of the disk with attenuate-subulate teeth; chaff of the pappus ovate or lanceolate-oblong, with long awns; fimbrillæ of the receptacle aristiform-subulate, not dilated at the base, slender, longer than the achenia.—*Fougeroux, in mem. acad. l. c. t.* 1 & 2; *Cass. in dict. sci. nat.* 18. *p.* 19; *DC. prodr.* 5. *p.* 652; *Gay, l. c.* G. bicolor, *Lam. dict.* 2. *p.* 590, & *ill. t.* 708; *Ait. Kew.* (*ed.* 2) 5. *p.* 129; *Torr.! in ann. lyc. l. c.* (excl. syn.) G. Drummondii, *DC.! l. c.* (excl. syn.), & 7. *p.* 292 (excl. syn. G. picta, *Sweet.*), fide *Gay.* G. bicolor *var.* Drummondii, integerrima, *Hook. bot. mag. t.* 3551? Calonnea pulcherrima, "*Buchoz, ic. t.* 126." Virgilia helenioides, "*L'Her. diss.* (*ic.*); *Smith, exot. bot.* 1. *p.* 71, *t.* 37."

Louisiana! Arkansas! and Texas! Introduced into the French gardens from Louisiana in the year 1786, and lost about 1791; again recently introduced by Drummond.—Heads an inch or more in diameter. Rays 10–12, attenuate at the base, deeply 3-cleft, violet-purple, the teeth yellow. Fimbrillæ 4–5 to each areola, rigid, persistent. Achenia involucrate with a villous ferruginous tuft.—In some specimens, (G. Drummondii, *DC.!*) the chaffy portion of the pappus is broadly ovate, in others ovate-oblong or oblong-lanceolate; but we observe no other difference. The fimbrillæ appear to be as long as in G. aristata.—According to Mr. Spach (*Ann. sci. nat.* (*n. ser.*) 15. *p.* 34), this is a perennial species, and to it he unites the following.

5. *G. picta* (Don): suffruticose, much branched; leaves sessile, linear-lanceolate, scarcely if at all dilated or clasping at the base, entire, or the lower ones with a few coarse teeth, and the upper denticulate; scales of the involucre equalling or exceeding the disk, hairy, callous and somewhat hirsute at the base; corolla of the disk with long subulate teeth; chaff of the pappus oblong-lanceolate; fimbrillæ of the receptacle 4–6 to each areola) subulate, rigid, dilated and triquetrous at the base, rather longer than the achenia. *Gay, l. c.—Don. in Brit. fl. gard. ser.* 2. *t.* 267. (excl. habitat Louisiana.) G. bicolor, var. Drummondii, *Hook. bot. mag. t.* 3368.

Rio Brazos, Texas, *Drummond!*—Leaves rather thick, often with a brownish margin, scabrous-ciliolate. Heads 12–15 lines in diameter. Rays about 12, broadly cuneiform, reddish-orange; the teeth yellow. Fimbrillæ stout, carinate at the base.—Resembles the preceding. In the indigenous, as well as in our cultivated specimens, the lower leaves are frequently sinuate-pinnatifid. Among the former, there is a state of the species with what appears like an annual root, and the stems only 3 inches high bear a single head.

* * *Pappus of the ray-flowers awnless.*

6. *G. amblyodon* (Gay): annual; stem hirsute-pubescent, simple or branching; leaves sessile, denticulate, scabrous-pubescent; the lowest somewhat spatulate; the others oblong-linear, somewhat auriculate at the base and clasping; involucre hirsute, rather longer than the disk, the scales callous and appressed for nearly half their length; corolla of the disk with short triangular rather obtuse teeth; chaff of the pappus lanceolate; fimbrillæ of the receptacle aristiform, unequal, not dilated at the base, mostly longer than the achenia.—*Gay! in ann. sci. nat. l. c. p.* 63.

Texas, *Drummond!*—Stem 10–18 inches high. Leaves numerous, rather thick, serrate towards the summit. Scales of the involucre imbricate in 3 to 4 series, more erect and callous at the base than in any other species, the intermediate ones longer than the exterior. Rays about 12, elongated cuneiform, deeply 3-toothed, brownish-purple throughout in the dried state. Pappus of the ray composed of 5–7 short ovate or obovate membranous scales, three or four of which are more or less mucronate, the others lacerate or denticulate at the summit.

116. PALAFOXIA. *Lagasca, nov. gen. h. Madr.* (1815) *p.* 26; *DC.*

Paleolaria, *Cass.* (1816), *Less.*—Polypteris, *Nutt.* (1818); not of *Less.*, nor of *DC.*

Heads 10–30-flowered; the flowers all perfect and tubular; or the exterior series either imperfectly or manifestly radiate; the rays 3-cleft, pistillate. Scales of the obconical or campanulate involucre 8–15, membranaceous or herbaceous with scarious tips, appressed (or spreading in fruit) in 1–2 series, shorter than the disk. Receptacle small, flat, naked or slightly alveolate. Corolla of the disk with a slender tube and an expanded deeply 5-cleft or 5-parted limb; the lobes linear or lanceolate, spreading, glabrous. Branches of the style long and filiform, flattish, glandular-pubescent throughout. Achenia quadrangular, slender, tapering to the base, minutely pubescent. Pappus of 6–12 membranaceous denticulate pinnately striate scales, furnished with a strong midnerve, which is thickened at the base and often somewhat produced at the apex; the pappus of the exterior flowers often much shorter.—Herbaceous or suffruticose (chiefly Mexican and Texan) cinereous or strigose-scabrous plants; the loosely paniculate or corymbose branches and peduncles often glandular. Leaves linear or lanceolate, entire, somewhat petioled, alternate, scattered, or the lower opposite, 1–3-nerved. Flowers white, flesh-colored, or purple.

§ 1. *Heads radiate, or with some of the marginal flowers palmate or irregular, and with a smaller pappus than the disk-flowers: scales of the involucre somewhat herbaceous, equal, in 1–2 series, often somewhat embracing the exterior achenia (nerves of the lobes of the disk-corolla intramarginal.)*—EUPALAFOXIA.

1. *P. Hookeriana:* leaves lanceolate, 1–3-nerved; heads (large) many-flowered, radiate; scales of the involucre 12 or more, very glandular (as well as the peduncles and branches), imbricated in 2 series; the exterior lanceolate; the interior obovate-lanceolate or oblong; rays 8–10, exserted, broadly cuneiform, deeply 3-cleft; limb of the disk-corolla 5-cleft below the middle; pappus of the disk-flowers of 6–8 narrowly lanceolate acuminate scales, as long as the attenuated hairy achenium; in the rays of as many obovate or spatulate very obtuse rigid scales, many times shorter than the nearly glabrous achenia.—P. Texana, *Hook.! ic. pl. t.* 148, not of *DC.*

β. subradiata: smaller; rays few and inconspicuous, irregular or palmate.—Stevia spacelata, (*Nutt. mss.?*) *Torr.! in ann. lyc. New York*, 2. *p.* 214.

Texas, *Drummond!* β. Arkansas, *Dr. James!* Texas, *Mr. Callana!*—Plant apparently 1–2 feet high, rather stout. Heads three-fourths of an inch in length; the showy rose-purple rays in Drummond's plant half an inch or more in length, resembling a Gaillardia; the disk-flowers also rose-color; the tube glandular. Scales of the involucre not embracing the achenia; which are very slender, and in the disk one-third of an inch long.—Between the long acuminate pappus of the central flowers, and the very short and obtuse nearly corneous scales of the rays, there is almost a complete gradation; the exterior flowers which have a tendency to become radiate presenting a

shorter and obtuser pappus.—This is the most showy species of the genus, and would be very ornamental in cultivation.

2. *P. Texana* (DC.): leaves linear-lanceolate, 1-nerved, or the lower 3-nerved; heads (rather small) many-flowered, discoid, 2 or 3 of the marginal flowers usually palmate or imperfectly radiate, not exceeding the disk; scales of the involucre 8–12, lanceolate, strigose-puberulent and slightly glandular, scarcely imbricated; limb of the corolla 5-cleft to the base; pappus of the disk-flowers of 8 lanceolate-ovate acute or cuspidate scales, rather shorter than the obpyramidal hairy achenium; in the marginal flowers broadly ovate, mostly obtuse, much shorter.—*DC.! prodr.* 5. *p.* 125.

Texas, *Berlandier! Drummond!*—2 ? A more slender plant than the preceding, scarcely glandular, with much smaller heads: the flowers apparently flesh-colored; the linear lobes of the corolla rather longer than the almost glabrous tube. Scales of the involucre scarious at the tip, partly embracing the exterior achenia.

§ 2. *Heads discoid, with the flowers and pappus all similar; the latter of short and rounded scales (nerves of the lobes of the corolla intramarginal): scales of the involucre nearly in a single series, equal, somewhat herbaceous, partly embracing the exterior achenia.*—FLORESTINARIA.

3. *P. callosa:* strigose-cinereous; the diffuse and dichotomous slender peduncles glandular; leaves narrowly linear, 1-nerved; heads (small) turbinate, 10–12-flowered; scales of the involucre 8–10, oblong, obtuse; limb of the corolla 5-cleft to the base; the oblong-linear lobes much longer than the tube; scales of the pappus 8, roundish-obovate, about one-fourth the length of the obpyramidal minutely hairy achenium.—Stevia callosa, *Nutt.! in jour. acad. Philad.* 2. *p.* 121; *Bart. fl. Amer. Sept. t.* 46. Florestina callosa, *DC.! prodr.* 5. *p.* 655.

Western Arkansas, *Nuttall!* Texas, *Drummond! Dr. Riddell!*—①? Stem slender, a foot high, corymbose at the summit. Leaves often 2 inches long, a line wide, frequently fascicled in the axils. Involucre 3 lines long; the scales slightly scarious at the apex. Flowers purple. Pappus uniform and resembling that of the ray-flowers in P. Hookeriana: the scales opaque and thickened in the centre and at the base, dilated above, with denticulate-lacerate margins.—The style is exactly as in Palafoxia, and very different from that of Florestina; and the leaves are undivided.

§ 3. *Heads discoid, with the flowers and pappus all similar; the latter of lanceolate pointed scales (nerves of the lobes of the corolla marginal): scales of the involucre somewhat scarious or membranaceous, flat, in 2–3 series; a few of the exterior small and bracteolate.*—POLYPTERIS, Nutt.*

4. *P. integrifolia:* stem slightly scabrous, fastigiate-corymbose above; leaves linear-lanceolate, 1-nerved, scabrous; heads (rather large) many-flowered; scales of the involucre 10–15; the inner oblong, obtuse; the exterior linear-lanceolate, loose; limb of the corolla 5-cleft below the middle; scales of the pappus 8–9 (12–14, *Nutt.*), linear-lanceolate, attenuate-acuminate, about the length of the slender slightly pubescent achenium.—Polypteris integrifolia, *Nutt.! gen.* 2. *p.* 139; *Ell.! sk.* 2. *p.* 314, not of *DC.* Paleolaria fastigiata, *DC. prodr.* 5. *p.* 125.

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* The character of Polypteris in *DC. prodr.* 5. *p.* 659, is drawn from a rayless state of Gaillardia lanceolata.

Dry pine woods, Southern Georgia! and Florida! Aug.–Oct.—2f Stem 2–5 feet high. Heads half an inch or more in length. Corolla, and sometimes the pappus purplish; the tube slightly pubescent. Achenia 3–4 lines long, blackish; the feathery pappus somewhat lacerate-denticulate.

117. CHÆNACTIS. *DC. prodr.* 5. *p.* 659; *Hook. & Arn. bot. Beechey.*

Heads many-flowered; the flowers all tubular and perfect; the exterior series (rays) more or less dilated and larger than the others, irregular or palmate. Scales of the campanulate involucre about 20, linear, nearly in a single series. Receptacle alveolate. Corolla glabrous or slightly glandular, the lobes hirsute-puberulent; of the disk tubular, slightly dilated above, 5-toothed; of the ray expanded or ventricose above, 5-cleft. Branches of the style linear-filiform, with long and slender acuminate hirsute appendages. Achenia linear, tapering to the base, 4-angled. Pappus of 4–12 somewhat unequal membranous nerveless scales, with irregularly denticulate margins; in the disk-flowers rather shorter than the corolla and about the length of the achenium; in the ray much shorter, obtuse.—Biennial, sometimes annual or perennial? herbs (natives of California, Oregon, and the Rocky Mountains); with alternate pinnately dissected leaves, and rather large heads terminating the simple or corymbose branches.

§ 1. *Flowers mostly yellow; those of the ray irregular or palmate, exserted: achenia minutely strigose: pappus of* 4–6 *scales; in the disk oblong-lanceolate, acute, in the ray much shorter and obtuse.*—Euchænactis.

1. *C. glabriuscula* (DC.): perennial or suffruticose; stem branching; leaves and involucre nearly glabrous, or with scattered cobwebby hairs; the expanded rays palmatifid, evidently longer than the disk; branches naked at the summit; lobes of the leaves 5–6 pairs, rather obtuse; the uppermost leaves linear and entire. *DC. prodr.* 5. *p.* 659.

California, *Douglas.*—We have no specimen of this plant. It is said to be 8 to 16 inches high, arenose-villous in the young state, but glabrous when mature; the peduncles, or naked summit of the branches, 2½ inches long. Scales of the pappus 5–6.

2. *C. tenuifolia* (Nutt.): annual or biennial, nearly glabrous; the involucre and short peduncles glandular-viscid; leaves 1–2-pinnately parted; the divisions irregular, small, linear; the uppermost leaves linear and 3–5-cleft at the apex; ray-flowers funnel-form, expanded, scarcely irregular, rather longer than the disk.—*Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 375.

St. Diego, California, *Nuttall!* May.—About a foot high, much branched. Divisions of the leaves numerous, 2–4 lines long. Heads as large as in the following species. Flowers bright yellow. Scales of the involucre numerous, narrowly linear, concave; a few similar scales also interposed between the ray and disk-flowers. Pappus of 4 unequal scales.—The leaves in our specimens by no means resemble those of Hymenopappus filifolius, but those of the following species do so. Nerves of the lobes of the corolla intramarginal, as in Hymenopappus.

3. *C. lanosa* (DC.): annual, clothed with a soft and loose somewhat deciduous white wool; stems branched from the base, simple and naked above; leaves (often glabrous when old) on slender petioles, pinnately parted; the

segments 3–5, narrowly linear, entire; the uppermost leaves linear and entire; ray-flowers tubulose-infundibuliform, somewhat irregular, scarcely exceeding the disk.—*DC.! prodr.* 5. *p.* 659.

California, *Douglas!*—Plant 8–12 inches high; the naked summit of the branches often 6 inches long. Involucre very woolly when young. Flowers light yellow. Lobes of the leaves one-half to one inch long.

4. *C. stevioides* (Hook. & Arn.): annual, somewhat glabrous; stem corymbosely branched; leaves somewhat woolly when young, pinnately divided; the divisions linear, obtuse, entire, or sometimes pinnatifid; involucre glandular-puberulent; flowers white or flesh-color; those of the ray tubulose-infundibuliform, scarcely irregular, about the length of the disk.—*Hook. & Arn.! bot. Beechey, suppl. p.* 353.

Interior of Oregon, in the Snake Country, *Mr. Tolmie!*—Plant 3–5 inches high. Heads smaller than the preceding. Scales of the involucre broadly linear. Pappus of 4–5 scales. Peduncles short. Upper leaves entire.

§ 2. *Flowers pale rose or flesh-color; those of the ray infundibuliform or expanded at the summit, regular, not longer than the others: achenia villous-hirsute: pappus of* 8–12 *scales, in the disk oblong-linear, scarcely shorter than the somewhat glandular corolla, in the ray much shorter, obtuse.*—Macrocarphus, *Nutt.*

5. *C. achilleæfolia* (Hook. & Arn.): tomentose-canescent; stems low, corymbose at the summit; leaves pinnately divided; the divisions crowded, linear or oblong, obtuse, mostly pinnatifid, the lobes very small; scales of the somewhat obconical involucre pubescent or tomentose; achenia hirsute; scales of the pappus in the disk-flowers linear, acutish, nearly the length of the corolla.—*Hook. & Arn.! bot. Beechey, suppl. p.* 354. Macrocarphus achilleæfolius, *Nutt.! l. c.*

Dry plains, interior of Oregon, (Snake Country) *Mr. Tolmie!* to the Rocky Mountains on the Colorado of the West, *Nuttall!* July–Aug.—② Stems several from the same root, 4–6 inches high. Leaves somewhat glabrous when old, densely woolly-canescent when young. Heads as large as in C. Douglasii, to which it is very closely allied.

6. *C. Douglasii* (Hook. & Arn.): loosely tomentose; stem corymbose at the summit; leaves pinnately divided: the divisions scattered, linear or oblong, obtuse, sinuate-toothed or pinnatifid; the lobes minute; scales of the hemispherical involucre glandular-pubescent (when young tomentose); achenia hirsute-villous; scales of the pappus linear-oblong, truncate.—*Hook. & Arn.! l. c.*, under C. achilleæfolia. Hymenopappus Douglasii, *Hook.! fl. Bor.-Am.* 1. *p.* 316; *Nutt.! in jour. acad. Philad.* 7. *p.* 30; *DC.! prodr.* 5. *p.* 658. Macrocarphus Douglasii, *Nutt.! in trans. Amer. phil. soc. l. c.*

Dry barren soil, interior of Oregon! and Rocky Mountains! July–Aug.—② Stems 1–3 feet high, fastigiate, somewhat glabrous when old. Heads half an inch in diameter. Pappus silvery; the scales toothed or lacerate at the apex; in the disk-flowers shorter than the corolla.

Subdiv. 2. EUHELENIEÆ.—Branches of the style in the disk-flowers obtuse or truncate, or tipped with a cone, pubescent or barbellate at the apex.

118. HYMENOPAPPUS. *L'Her.; Cass.; DC. prodr.* 5. *p.* 658.

Heads many-flowered; the flowers all tubular and perfect, similar and regular. Scales of the involucre 6–12, somewhat in 2 series, oval or ob-

ovate, membranaceous or petaloid (white), obtuse. Receptacle small, naked. Corolla with a slender glandular tube, and a dilated campanulate throat; the lobes revolute. Anthers exserted. Branches of the style linear, with a very short obtuse or conical appendage. Achenia turbinate, contracted at the base as if stipitate, broad at the summit, many-striate, somewhat 4-sided when mature. Pappus of 12–20 short and obtuse membranaceous (nearly nerveless) scales, in a single series.—Biennial or perennial (N. American) herbs, clothed with a white often deciduous wool, or somewhat glabrous; with sulcate-angled stems, and corymbose or solitary heads. Leaves alternate, pinnately lobed or divided. Flowers whitish, in a single species yellow.

* *Scales of the spreading involucre, and often the bracts, petaloid (whitish): corolla with a filiform tube, and a deeply cleft limb (the nerves of the lobes intermediate between the margins and the axis).*

1. *H. scabiosæus* (L'Her.): clothed with a more or less deciduous appressed wool; leaves pinnately, or the radical and lower bipinnately parted; the segments linear or oblong, entire or sparingly toothed; heads (rather large) in nearly simple and loose small corymbs; scales of the involucre (about 10) roundish-obovate, petaloid, dilated, exceeding the disk; achenia somewhat hairy; scales of the pappus very small.—"*L'Her. diss. cum ic.*"; *Michx.! fl.* 2. *p.* 104; *Pursh, fl.* 2. *p.* 519 & 742; *Ell. sk.* 2. *p.* 313; *DC. prodr.* 5. *p.* 658. Rothia Caroliniensis, *Lam. jour. hist. nat.* 1. *p.* 16, *t.* 1, & *ill. t.* 667.

Dry pine barrens, and around ponds, South Carolina! to Florida! Also Western Louisiana, *Dr. Hale!* April–May.—ⓒ or 4 ? Stem 1–3 feet high. Leaves variable, when young often tomentose, woolly or canescent on both sides, at length frequently glabrous or nearly so, as well as the stem. Achenia somewhat hairy when young, minutely glandular-pubescent (under a lens) when mature.

2. *H. artemisiæfolius* (DC.): stem woolly when young, paniculate-branched; leaves densely tomentose-canescent beneath; the radical and lower cauline petioled, lanceolate-oblong, entire, or often sinuate-incised or pinnatifid, especially towards the base; the upper sessile, pinnatifid with the terminal lobe largest, the lateral lobes lanceolate, acute; the uppermost often entire; heads (small) numerous, in loose compound corymbs; scales of the involucre (8–10) oval or oblong, unequal, petaloid, scarcely exceeding the disk; achenia villous; scales of the pappus somewhat conspicuous, spatulate-oblong.—*DC. prodr.* 5. *p.* 658.

Texas, *Berlandier, Drummond! Mr. Lindheimer!*—ⓒ Stem 2–3 feet high. Radical leaves 4–6 inches long. Corymb large, glandular-tomentose. Heads much smaller than in the preceding.

3. *H. corymbosus:* somewhat tomentose when young, at length nearly glabrous; stem much branched; leaves 1–2-pinnately divided, the divisions or lobes narrowly linear, often incised or toothed; heads (small) very numerous, in compound corymbs; scales of the involucre (8–12) oblong-obovate, petaloid (the base mostly herbaceous), about the length of the disk; achenia glandular, somewhat pubescent on the angles; scales of the pappus minute, orbicular.

β. Nuttallii: lower leaves 3-pinnately, the upper 1–2-pinnately divided or parted; the segments very narrowly linear, mostly entire.—H. tenuifolius, *Nutt.! in herb. DC.* &c. (pl. Arkans.), not of *Pursh.*

Prairies of Arkansas, *Dr. Leavenworth!* Texas, *Drummond!* β. Red River, Arkansas, *Nuttall!*—② Stem 2–3 feet high, loosely corymbose above; the branchlets minutely tomentose and somewhat glandular. Lower leaves somewhat petioled. Heads one-fourth to one-third of an inch in diameter. Scales of the involucre unequal, the larger somewhat dilated.—The pappus in var. β. is somewhat more conspicuous, and the lobes of the leaves more slender. So far as relates to the specimen of Nuttall, this is the H. tenuifolius of De Candolle, who, unacquainted with Pursh's plant, has modified the character of that author, so that it no longer accords with either species.

* * *Scales of the appressed involucre with whitish or scarious margins: tube of the corolla not longer than the* 5*-toothed or cleft limb.*

4. *H. tenuifolius* (Pursh): lanuginous-canescent; stem stout, corymbose at the summit; leaves bipinnately divided; the divisions very narrowly linear, entire, rigid, somewhat glabrous; heads in a loose compound corymb; scales of the involucre (6–8) oval, appressed; much shorter than the fully developed disk; achenia very villous; scales of the pappus spatulate-oblong, as long as the tube of the corolla.—*Pursh! fl. 2. p. 742; Nutt.! gen. 2. p.* 139; *DC. prodr.* 5. *p.* 658. (excl. syn. *Nutt. pl. Arkans.*, and a part of the character founded on it.)

Upper Missouri, *Bradbury! Nuttall!* (v. sp. in *herb. Lamb.*) *Mr. Nicollet!* on gravelly hills, &c. May–June.—② Stem 12–15 inches high. Leaves sessile, rigid, the pinnæ of the lower in 8–12 pairs; the divisions 2–4 pairs, irregular and unequal; occasionally somewhat 3-pinnatifid. Heads pedunculate, fastigiate, a third of an inch in diameter; the involucre not spreading and petaloid as in all the preceding. Flowers greenish-white. Throat of the corolla short, abruptly inflated, about the length of the tube, deeply 5-toothed. Achenia more villous, and the pappus more conspicuous than in any other species; the scales of the latter somewhat denticulate at the apex.

5. *H. filifolius* (Hook.): tomentose-canescent, the pubescence somewhat deciduous; stem loosely paniculate-branched; leaves 1–2-pinnately divided; the divisions scattered, rigid, filiform-linear, canaliculate; peduncles mostly solitary; scales of the involucre (about 12) oval, appressed, shorter than the disk; achenia villous; scales of the inconspicuous pappus somewhat lacerate.—*Hook.! fl. Bor.-Am.* 1. *p.* 317; *Nutt.! in trans. Amer. phil. soc. l. c. p.* 374.

Arid plains of the upper Oregon, *Douglas! Nuttall!*—♃? Stem 10–20 inches high. Lower leaves petioled: the divisions few, often simple and an inch or more in length. Heads fully as large as in the preceding. Achenia less angled or tapering at the base, not dilated at the apex; the hyaline scales of the pappus nearly concealed among the villous hairs of the achenium, and shorter than the tube of the (white) corolla.—In Mr. Nuttall's specimens, the pappus is more conspicuous than in those collected by Douglas.

6. *H. luteus* (Nutt.): dwarf, woolly-canescent; stems several from a thick caudex; leaves petioled, chiefly radical, pinnately-divided; the divisions very much crowded, small, pinnatifid or trifid; the lobes very short, linear, obtuse; heads (small) somewhat paniculate; scales of the involucre (about 12) oblong-obovate, appressed, rather shorter than the disk; achenia very villous; scales of the pappus lacerate or denticulate, shorter than the tube of the (yellow) corolla.—*Nutt.! in trans. Amer. phil. soc. l. c.*

Rocky Mountains near the sources of the Colorado of the West, particular-

ly on Ham's Fork, *Nuttall!*—2ℓ Stems 4–10 inches high, bearing 3–5 heads. Involucre tomentose, scarious. Pappus nearly as long as in H. tenuifolius, but not exserted beyond the very long villous hairs of the achenium. Throat of the corolla campanulate, 5-toothed; the nerves marginal.—The plant has the aspect of a Chænactis.

119. BAHIA. *Lagasca, nov. gen., in elench. hort. Madr. p.* 28; *DC. l. c.*

Bahia & Eriophyllum, *Lagasca.*—Trichophyllum, *Nutt.*

Heads many-flowered; the ray-flowers 5–11, ligulate, pistillate; those of the disk tubular, perfect. Scales of the subglobose, ovoid, or campanulate involucre in a single or somewhat double series, equal, appressed. Receptacle naked, or somewhat alveolate-fimbrillate. Tube of the corolla glandular-hairy. Branches of the style in the disk-flowers thickened at the apex, obtuse. Achenia 4-sided, linear, or oblong-turbinate. Pappus of 4–10 oval or oblong and mostly obtuse scarious nerveless small scales.—Perennial woolly herbs or suffruticose plants (natives of the Pacific coast of America from Chili to Nootka, of Oregon, Mexico, &c.); with opposite or alternate often cleft or divided leaves, and solitary or corymbose and clustered heads, with yellow rays, which often turn brownish in drying.

* *Shrubby or suffrutescent: heads corymbose.*

1. *B. artemisiæfolia* (Less.): leaves crowded, mostly alternate, nearly glabrous above, densely lanate-tomentose and white beneath, remotely pinnatifid (the lobes 1–3 on each side, linear or oblong, obtuse); some of the upper often entire, spatulate-linear; scales of the cylindraceous involucre scarcely woolly, oblong; rays small, oval; achenia minutely hispid along the angles; scales of the pappus mostly 8, obtuse; four of them (corresponding to the angles of the achenium) linear, the others oblong and rather shorter.—*Less. in Linnæa*, 5. *p.* 160. & 6. *p.* 253; *Hook. & Arn.! bot. Beechey, p.* 149, & *suppl. p.* 353; *DC. prodr.* 5. *p.* 567. (Heads in the plant of Chamisso 2½ lines long; in that of Douglas &c. (*β.* Douglasii, *DC.! l. c.*) 3–4 lines long.)

β.? lower leaves sparingly pinnatifid; the upper mostly entire.—B. stæchadifolia *β.* Californica, *DC. l. c.*; *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 374.

California, *Menzies, Chamisso, Douglas! Nuttall!* &c.—A low shrub. Heads on distinct peduncles when the compact corymbs are simple, but often somewhat fascicled and sessile.—Without much doubt the B. stæchadifolia *β.* Californica of De Candolle is a state of his B. artemisiæfolia *β.* Douglasii; but we have not the means of satisfying ourselves whether the latter has been correctly united with the B. artemisiæfolia of Lessing, which is said to have sessile or slightly pedicillate heads, only two and a half lines in length.

2. *B. confertiflora* (DC.): stem and branches densely arenose-tomentose or woolly; leaves alternate, canescently tomentose beneath, pinnately 5–7-parted, with narrowly linear segments, or often 3-parted, with the middle division 3-toothed at the apex; heads (small) in dense corymbs; scales of the ovoid involucre (about 5) obovate, retuse, woolly-canescent; rays 3–4, small, nearly orbicular; achenia slightly scabrous-pubescent; scales of the pappus 8–10, oblong, denticulate, nearly equal.—*DC.! prodr.* 5. *p.* 657; ***Nutt.! in trans. Amer. phil. soc. l. c.***

California, *Douglas! Nuttall!* April.—Plant shrubby at the base, about a foot high. Lower divisions of the leaves largest. Heads clustered, but on distinct peduncles when in fruit. Involucre about two lines long.

3. *B. trifida* (Nutt.): stem and involucre closely arenose-woolly when young; leaves alternate, cuneate-oblong, closely sessile and partly clasping, loosely tomentose beneath, 3-cleft at the apex; heads (small) in crowded corymbs; scales of the obovoid involucre 5, broadly obovate; rays 4–5, broadly oval, small; achenia glabrous, or slightly hairy along the angles; scales of the pappus 10–14, equal, oblong, obtuse, nearly entire.—*Nutt.! in trans. Amer. phil. soc. l. c.*

St. Barbara, California, *Nuttall!* April.—Growing with the preceding; the heads about the same size. Leaves very numerous, about half an inch long, nearly glabrous above.

4. *B. achillæoides* (DC.): woolly-tomentose throughout; leaves alternate, cuneiform, with a long attenuate base, bipinnatifid above; the lobes (2–4 pairs) small, entire or toothed; heads (rather large) solitary, terminating the sparingly corymbose branches or peduncles; scales of the globose very woolly involucre about 10, ovate-lanceolate, acute; rays 8–10, oblong; achenia hairy on the angles; scales oval or oblong, somewhat unequal, laciniate-toothed at the apex.—*DC.! prodr.* 5. *p.* 637.

California, *Douglas!*—Suffruticose, branched from the base. Leaves less than an inch long, laciniate-bipinnatifid. Heads not clustered. Rays 3–4 lines long.

* * *Herbaceous: heads solitary on naked simple peduncles.*

5. *B. lanata* (Nutt.): stems mostly branched from the decumbent base, lanuginous-tomentose; leaves lanuginous-tomentose beneath, alternate, or the lower opposite, pinnatifid; the uppermost often linear and entire; heads (large for the genus) on naked peduncles; rays large; achenia glabrous.—*DC.! prodr.* 5. *p.* 637; *Nutt.! in trans. Amer. phil. soc. l. c.* Achillea lanata, *Pursh, fl.* 2. *p.* 560. Trichophyllum lanatum. *Nutt. gen.* 2. *p.* 167; *Hook.! fl. Bor.-Am.* 1. *p.* 315; *Fisch. & Meyer, 2nd ind. sem. hort. St. Petersb.* 1835, *p.* 51. Eriophyllum cæspitosum, *Dougl.! in Lindl. bot. reg. t.* 1167. Helenium lanatum, *Spreng. syst.* 3. *p.* 574. Phialis, *Spreng. gen. p.* 631.

β. tenuifolia: stem slender and often simple; heads smaller; divisions of the leaves narrowly linear, entire, or often lobed.—B. tenuifolia, *DC.! l. c.; Nutt.! l. c.*

Oregon, common from the Rocky Mountains to the Coast! (The B. tenuifolia, *DC.* was probably collected in Oregon instead of California.)—Stems 10–15 inches high, frequently branched above, with the peduncles somewhat corymbose. Segments of the leaves 1–3 pairs. Involucre subglobose, composed, as in the following species, of about 12 oval or oblong connivent scales, which are all clothed with a dense and intricate wool. Scales of the pappus oblong and obtuse, somewhat unequal, denticulate at the apex, often a little united at the base.

6. *B. leucophylla* (DC.): lanuginous-tomentose throughout; stems branched from the base, naked above; leaves alternate and sometimes opposite, oblanceolate or oblong-spatulate, 3-cleft or lobed at the apex, or somewhat pinnately incised, or often (especially the upper) entire; heads solitary on long naked peduncles; rays oblong, rather large; achenia glabrous.—*DC.! prodr.* 5. *p.* 656. B. integrifolia, *DC. l. c.* Trichophyllum integrifolium, *Hook. fl. Bor.-Am.* 1. *p.* 316. T. multiflorum, *Nutt.! in jour. acad. Philad.* 7. *p.* 37.

Rocky Mountains! to the coast of Oregon! and Nootka, &c. July.—Stems 5–12 inches high. Leaves an inch or more in length; the upper linear. Heads 25–35-flowered, as large as in the preceding; the scales about 12, oval-oblong. Pappus of mostly 4 oblong or lanceolate acutish scales, and as many alternate smaller scales, the latter often denticulate at the apex. The leaves vary greatly.

7. *B. gracilis* (Hook. & Arn.): lanuginous-tomentose throughout; stems branched from the base, naked above; leaves alternate, attenuate, linear, obtuse, entire; the lower somewhat spatulate; heads terminating the long simple peduncles; rays large; achenia glandular-pubescent.—*Hook. & Arn.! bot. Beechey, suppl. p.* 353.

Interior of Oregon, Snake Fort, *Mr. Tolmie!*—Stems slender, 8–10 inches high. Leaves nearly 2 inches long, about a line wide. Scales of the involucre oblong. Rays bright yellow in the dried specimens. Pappus of about 10 small oblong scales.

‡ *Species unknown to us.*

8. *B. oppositifolia* (Nutt., *under* Trichophyllum): decumbent and much branched, canescently pubescent; leaves opposite, all palmately 3-cleft; the segments ligulate, simple, or divaricately subdivided; peduncle filiform, mostly dichotomal, scarcely longer than the leaves. *Nutt.—DC. prodr.* 5. *p.* 657. Trichophyllum oppositifolium, *Nutt. gen.* 2. *p.* 167.

Denudated sterile hills near Fort Mandan on the Missouri, abundant. July–Aug.— 2 ? Stem diffuse, 6–12 inches high. Leaves petiolate, canescent; the pubescence very short: segments about an inch long, thickish, linear, somewhat obtuse. Peduncle slender, 1–2 inches long. Involucre oblong-cylindrical; the scales 5–8, oblong-ovate: rays about the same number, very short. Pappus minute, of 5–8 partly obtuse and somewhat lacerate scales. Achenia nearly smooth. Plant sensibly bitter, and destitute of aroma. *Nuttall.*

120. ACTINOLEPIS. *DC. prodr.* 5. *p.* 655; *Hook. ic. pl. t.* 325.

Heads several-flowered; the ray-flowers 3–5, ligulate, pistillate; those of the disk tubular, perfect and fertile! Involucre oblong-campanulate, bracteate at the base, tomentose; the scales about 5, oblong-obovate, obtuse, connivent after flowering, and involute so as to include the achenia of the ray. Receptacle small, convex, naked. Rays slightly exserted, oval, mostly 2-toothed, raised on a slender tube. Corolla of the disk with a slender tube (pubescent with jointed hairs), and a spreading deeply 5-lobed limb. Branches of the style in the disk-flowers short, rather flat, terminated by a very obtuse puberulent cone, or almost truncate. Achenia slender, terete, striate, tapering to the base; those of the ray minutely hairy, crowned with a (somewhat deciduous?) pappus of 10–15 narrow and almost aristiform acute unequal scales, slightly united at the base; those of the disk similar, but glabrous and destitute of pappus.—A low (2–6 inches) and slender diffusely branched annual herb, clothed with loose somewhat deciduous wool; the stems corymbosely branched. Leaves alternate (opposite, *DC.*), very small (2–3 lines long), sessile, cuneate-obovate, deeply and very obtusely 3-toothed at the apex. Heads small, solitary and sessile in the forks of the

stem, and somewhat glomerate at the extremity of the branches; the bracts (1–2) similar to the leaves. Flowers of the disk and ray yellow. Anthers nearly white. Achenia black.

A. multicaulis (DC.! l. c.)—*Hook. & Arn.! bot. Beechey, suppl. p.* 353.

California, *Douglas!*—Our description differs considerably from that of De Candolle, who perhaps examined an imperfect specimen. He describes the disk-flowers as probably sterile with the style undivided, and does not notice the involution of the involucral scales so as nearly to enclose the ray-achenia, as in the Madieæ; but we find the disk-flowers (perhaps every one) fertile.

121. LASTHENIA. *Cass.; DC. in Lindl. bot. reg. t.* 1780, *& prodr. l. c.*

Heads many-flowered; the ray-flowers 5–15, pistillate, ligulate, obliquely truncate and included, or oblong and exserted; those of the disk tubular, perfect. Involucre as long as the disk, campanulate, composed of 5–15 scales united nearly to the summit; the teeth triangular, acute, ciliate. Receptacle conical, papillose. Corolla of the disk with a slender glandular-pubescent tube, and a campanulate 5-toothed limb. Branches of the style in the disk-flowers terminated by a short cone. Achenia linear-oblong, compressed, appressed-pubescent or glabrous. Pappus of about 10 unequal acute lacerate-toothed chaffy scales, or none!—Annual diffusely branched (Chilian and Californian) herbs, growing in wet places; with opposite linear or lanceolate mostly entire leaves, somewhat connate at the base. Heads solitary, terminating the branches; the elongated peduncles more or less dilated and obconical at the base of the involucre. Flowers yellow: the anthers yellowish.

§ 1. *Pappus of* 9 *or* 10 (*rarely* 5?) *unequal chaffy scales: rays very short, included.*—LASTHENIA, Cass. (Rancagua, *Pœpp. & Endl.*)

1. *L. glaberrima* (DC.): involucre about 15-toothed; pappus as long as the disk-corolla, and nearly equalling the obliquely truncate included rays; the scales lanceolate or oblong, the larger ones cuspidate; plant glabrous throughout.—*DC.! prodr.* 5. *p.* 664; *Hook. & Arn. bot. Beechey, l. c.* L. Californica, *DC. ined.*, not of *Lindl.*

California, *Douglas!*—Plant slender, 6–12 inches high. Leaves 2–3 inches long, 1–2 lines wide. Corolla much shorter than the achenia. (Scales of the pappus 5, according to De Candolle.)

§ 2. *Pappus none: rays exserted, conspicuous.*—HOLOGYMNE, Bartl. (Lasthenia, *Lindl., Endl.*)

2. *L. glabrata* (Lindl.): involucre 10–15-toothed; peduncles and young leaves slightly and minutely pubescent.—*Lindl.! bot. reg. t.* 1780; *DC.! l. c.; Nutt.! in trans. Amer. phil. soc. l. c.* L. Californica, *Lindl. bot. reg. l. c.* (note) *& t.* 1823; but not the plant to which this name was originally applied by De Candolle. Hologymne glabrata, *Bartl. ind. sem. Gœtt.* 1837 & 1839, *& in Linnæa*, 12. *suppl. p.* 81; *Hook. & Arn. bot. Beechey,*

suppl. p. 354; *Hook. bot. mag t.* 3730; *Fisch., Meyer, & Lallem. ind. sem. St. Petersb.* 1840.

California, *Douglas! Nuttall!* Common in cultivation.—Closely resembles the preceding, except in the conspicuous rays, rather larger heads, and entire absence of the pappus; the corolla of the disk is also much longer; the lobes sparsely barbellate. The cultivated specimens are often entirely glabrous. We are only acquainted with a single species of Hologymne.

122. BURRIELIA. *DC. prodr.* 5. *p.* 663.

Heads many-flowered; the ray-flowers 3–12, pistillate, ligulate (rarely very short); those of the disk tubular, perfect. Scales of the spreading or somewhat campanulate involucre 3–12, oval, acuminate, in 1–2 series, nearly equal, a little longer than the disk. Receptacle conical, papillose. Corolla of the disk with a slender tube, and an expanded 5-toothed limb. Branches of the style terminated by a very short obtuse coue. Achenia linear-fusiform or tetragonal, often somewhat compressed. Pappus of 2–5 lanceolate-awned scales or subulate awns, about the length of the corolla, or sometimes none!—Slender and somewhat pubescent annual (Californian) herbs; with opposite linear entire and sessile leaves, and solitary heads on slender peduncles, terminating the stem or branches. Flowers yellow: the anthers yellowish.

§ 1. *Pappus awned; that of the ray similar but more slender.*—BURRIELIA proper.

* *Rays very short: appendages of the style acute: lobes of the disk-corolla glabrous.*

1. *B. microglossa* (DC.! l. c.): villous-pubescent; scales of the involucre and rays 3–4, the included ligules shorter than the styles; disk-flowers 6–12; achenia attenuated, minutely scabrous; pappus 2–4- (or the in rays 1-) awned.

California, *Douglas!*—Plant resembling a Pectis, 3–4 inches high; the heads appearing discoid. Leaves often an inch long, and a line wide.

* * *Rays obovate or oblong, exserted: lobes of the disk-corolla slightly barbellate.*

2. *B. tenerrima* (DC.! l. c.): stem simple, filiform, nearly glabrous; scales of the involucre and the obovate rays about 5; achenia slender, glabrous; pappus 1–3-awned.

California, *Douglas!*—Stem 3–4 inches high. Leaves filiform, half an inch long. Rays short.

3. *B. parviflora* (Nutt.): much branched, diffuse, almost glabrous; scales of the involucre and the oblong rays about 8; achenia minutely scabrous-canescent, linear-obconical; pappus 2–3-awned from a broad base.—*Nutt.! in trans. Amer. phil. soc. l. c. p.* 381.

St. Barbara, California, *Nuttall!*—Stems 2–3 inches high. Leaves nearly filiform, half an inch long, pubescent when young. Heads many-flowered, 2–3 lines long; involucre turbinate. Rays short. Scales of the pappus triangular-ovate, short, abruptly awned.

4, *B. gracilis* (DC.): appressed, pubescent or hairy; stem sparingly

branched; scales of the involucre and the oval rays 10–14; achenia fusiform, compressed-4-sided, or those of the ray obcompressed; pappus of 4–5, or in the rays 2–3, lanceolate-subulate awns.—*DC.! prodr.* 5. *p.* 664; *Bartl. ind. sem. hort. Gœtt.* 1837, & *in Linnæa*, 12. *suppl. p.* 80; *Hook.* & *Arn. bot. Beechey, suppl. p.* 354; *Hook. bot. mag. t.* 3758. B. gracilis & B. longifolia, *Nutt. l. c.*

California, *Douglas! Nuttall!*—Plant 5–10 inches high, weak, decumbent. Leaves about 2 inches long, and a line wide, slightly fleshy. Expanded heads half an inch or more in diameter. Rays rather longer than the involucre.

§ 2. *Pappus none.*—BAERIA, Fisch. & Meyer.

5. *B. chrysostoma:* appressed-pubescent or hairy; stems loosely branched; scales of the involucre and the elliptical rays 10–13, achenia glabrous.—Baeria chrysostoma, *Fisch.* & *Meyer! 2nd ind. sem. St. Petersb.* (*Dec.* 1835) *p.* 29; *Don, in Sweet, Brit. fl. gard. ser.* 2. *t.* 395; *DC. prodr.* 7. *p.* 254; *Hook.* & *Arn. bot. Beechey, suppl. p.* 354. Burrielia (Amphiachænia) hirsuta, *Nutt.! l. c.*

California, *Fischer* & *Meyer, Douglas! Nuttall!*—Plant 6–12 inches high, glabrous below. Leaves 1½ to 3 inches long, 1–2 or 3 lines wide, somewhat channelled above and connate at the base, as in the other species. —This and the preceding species are common in cultivation, and resemble each other so closely that they are apparently undistinguishable, except by the absence of the pappus in B. chrysostoma. As similar isomorphous species occur in Lasthenia, Hymenoxys, &c., we cannot consider the mere absence of the pappus as of generic consequence in this tribe. But since many botanists hold a different opinion, we think it inexpedient to increase the synonymy by employing the somewhat anterior name of Baeria for the whole genus.

123. DICHÆTA. *Nutt. in trans. Amer. phil. soc.* (*ser.* 2.) 7. *p.* 383.

Heads many-flowered; the ray-flowers 5–12, ligulate, pistillate; those of the disk tubular, perfect. Scales of the somewhat campanulate involucre as many as the rays, nearly equal and in a single series, ovate, scarcely as long as the disk. Receptacle conical, alveolate; the alveoli toothed. Corolla of the disk with an inflated 5-lobed limb; the apex of the lobes and the slender tube minutely glandular-hairy. Branches of the style truncate, minutely barbellate at the apex. Achenia attenuate-obconical, 4-angular, somewhat hairy. Pappus of the ray and disk similar, composed of 4–8 oblong nerveless obtuse chaffy scales, (equalling the tube of the corolla,) which are fimbriate-laciniate at the apex, and 2 (rarely 3 or 4) subulate awns about the length of the corolla.—Annual small (Californian) herbs, growing in wet places and on the margin of ponds, villous-hairy when young, nearly glabrous when old; with opposite laciniate-pinnatifid leaves, or the upper linear and entire. Heads terminating the stem or branches. Flowers yellow.

This genus is, as it were, intermediate between Hymenoxys and Burrielia; D. tenella having exactly the habit of the latter, and D. uliginosa nearly that of Hymenoxys (Ptilopsis) mutica; which, moreover, presents a similar pappus, except that the intermediate awns are wanting.

1. *D. uliginosa* (Nutt.! l. c.): decumbent, branching; leaves crowded near the base, laciniate-pinnatifid; the lobes linear; the rachis broad: rays and scales of the involucre 8–12.

St. Barbara, California, *Nuttall!* April.—Plant 4–6 inches high, almost aquatic. Lower leaves 2–3 inches long. Heads one-third to half an inch in diameter, including the short oblong rays. Scales of the pappus often somewhat united; the awns slightly dilated below, minutely serrulate-scabrous.

2. *D. tenella* (Nutt.! l. c.): stem erect, simple, slender; leaves linear; the upper entire; the lower sparingly laciniate-pinnatifid towards the base; rays and scales of the involucre 5–8.

St. Barbara, California, growing with D. uliginosa, *Nuttall!* April.—Plant 3–4 inches high, resembling Burrielia gracilis. Stem and leaves hairy.

124. HYMENOXYS. *Cass. dict.* 55. *p.* 278; *DC. prodr.* 5. *p.* 661.

Heads many-flowered, discoid, or often radiate; the ray-flowers 8–10, ligulate, pistillate; those of the disk tubular, perfect. Scales of the involucre in 1–2 series, appressed, nearly the length of the disk. Receptacle conical, alveolate, mostly pilose or glandular. Corolla of the disk with a slender (sometimes minutely glandular) tube, and an expanded 5-toothed limb; the lobes glabrous, or slightly bearded. Branches of the style short, truncate and minutely barbellate at the apex. Achenia usually turbinate, and silky-villous. Pappus of 5–12 unequal chaffy acuminate or awned scales, minutely denticulate, mostly similar but often smaller in the ray (in § 2, awnless, or entirely wanting!).—Annual or sometimes perrennial? (South American, Mexican, and Californian) branching nearly glabrous and minutely glandular herbs, exhaling the odor of Chamomile, with rather small showy heads terminating the branchlets. Leaves alternate or opposite in the same plant, 1–2-pinnately parted into linear-filiform or almost capillary segments. Flowers yellow.

§ 1. *Heads radiate: scales of the pappus (at least in the disk-flowers) awned.* —OXYPAPPUS, DC. (Ptilomeris, *Nutt.*)

1. *H. Californica* (Hook.): achenia fusiform, minutely strigose; pappus of mostly 10 (8–12) small lanceolate or oblong denticulate-serrate scales; in the disk-flowers terminated with long awns a little shorter than the corolla; in the ray with 2–4 of the scales awned; the others awnless and smaller; scales of the involucre lanceolate; leaves mostly opposite; the divisions capillary; the rachis often broad towards the base.—*Hook. bot. mag. t.* 3828. Ptilomeris aristata, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 382.

β. coronaria: scales of the pappus of the ray small and acute, but all of them awnless; receptacle more hairy.—Ptilomeris coronaria, *Nutt.! l. c.*

St. Diego, California, *Nuttall!* April.—(1) Branched from the base, minutely glandular-puberulent. Scales of the involucre somewhat embracing the ray-achenia, which are a little incurved. Rays oblong, 2–3-toothed at the apex. Achenia linear-obconical or fusiform. Receptacle pilose.—This plant has been, we think, correctly referred by Hooker to Hymenoxys. The two following species have precisely the same aspect, foliage, involucre, &c., and can only be distinguished by the pappus.

§ 2. *Heads radiate: pappus awnless, or none!*—PTILOPSIS, Nutt. (Ptilomeris, *excl. spec*, & § Ptilopsis, *Nutt.*)

2. *H. mutica:* scales of the pappus 6–8, oblong, truncate or obtuse, laciniate at the summit, equal, shorter than the proper tube of the corolla; that of the ray smaller.—Ptilomeris mutica. *Nutt.! l. c.*

California, with the preceding, *Nuttall.*

3. *H. calva:* pappus of the ray and disk none.—Ptilomeris (Ptilopsis) anthemoides, *Nutt.! l. c.*

California, with the preceding, and in no way distinguishable, apparently, except by the achenium. *Nuttall!*

125. ACTINELLA. *Pers. syn.* 2. *p.* 469; *Nutt. gen.* 2. *p.* 173.

Actinea, *Juss.*—Ptilepida, *Raf.*—Picradenia, *Hook.*

Heads many-flowered; the ray-flowers 8–12, pistillate, ligulate, cuneate-oblong, 3-toothed or lobed at the apex; those of the disk tubular, perfect. Scales of the hemispherical involucre lanceolate or ovate, appressed, in 1–3 series, nearly equal, rather shorter than the disk. Receptacle hemispherical or conical, naked. Corolla of the disk cylindraceous, with the proper tube very short, 5-toothed; the teeth erect glandular-bearded. Branches of the style linear, truncate and barbellate at the apex. Achenia turbinate, short, densely silky-villous. Pappus of 5–12 ovate or ovate-lanceolate membranaceous 1-nerved and awned scales with denticulate or eroded margins.—Low chiefly perennial or suffruticose (American) plants; with the leaves linear or lanceolate, entire or 2–3-parted, impressed-punctate; the cauline alternate, sessile. Heads solitary, pedunculate. Flowers yellow, rarely white? sprinkled with bitter resinous globules.

* *Caulescent: stems numerous from a thick caudex: leaves sparingly pinnately parted.*

1. *A. Richardsonii* (Nutt.): puberulent; leaves petioled, rigid, irregularly 3–7-parted towards the summit; the segments glandular-punctate, filiform-linear, entire, or the terminal one 2-toothed; scales of the involucre ovate-lanceolate, in two series, the exterior united at the base; pappus of 5–7 ovate-lanceolate cuspidate-awned scales.—*Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 379. Picradenia Richardsonii, *Hook.! fl. Bor.-Am.* 1. *p.* 317, *t.* 108; *DC. prodr.* 5. *p.* 665.

About Carlton House, on the Saskatchawan, *Richardson!*—A span high, rigid, branching above. Heads an inch in diameter, including the (8–10) obovate-oblong yellow rays. Branches of the style flat, truncate and bearded at the apex! Achenia clothed with long tawny villous hairs. Pappus shorter than the corolla of the disk.

* * *Cæspitose, mostly dwarf and acaulescent: leaves crowded or rosulate, usually entire: scapes simple, naked.*

2. *A. acaulis* (Nutt.): leaves densely clustered on the thick caudex, linear-spatulate, silky-villous, as well as the scapes when young, and the involucre; the scales of the latter lanceolate-oblong, in 2 series; scales of the

pappus 5–7, broadly ovate, tipped with slender awns.—*Nutt.! gen.* 2. *p.* 173, & *in trans. Amer. phil. soc. l. c.* Actinea acaulis, *Spreng. syst.* 3. *p.* 574; *Torr.! in ann. lyc. New York*, 2. *p.* 213. Galardia acaulis, *Pursh! fl.* 2. *p.* 743. Cephalophora (Actinella) acaulis, *DC. prodr.* 5. *p.* 663.

Dry chalky soil, along the upper part of the Missouri & Platte Rivers, *Bradbury, Nuttall! Dr. James!*—Plant growing in very dense tufts. Leaves 1–2 inches long, the silky pubescence dense and appressed. Scapes 3–6 inches long. Heads three-fourths of an inch in diameter, including the 10–12 cuneate-oblong yellow rays. Proper tube of the disk-corolla almost none. Receptacle hemispherical. Achenia very villous. Pappus nearly equalling the corolla of the disk.

3. *A. Torreyana* (Nutt.): densely cæspitose; scapes, involucre, and axils of the leaves very tomentose; leaves clustered, narrowly linear, obtuse, sparsely hairy, strongly punctate with blackish dots, usually as long as the scape; scales of the involucre oblong-ovate, with scarious margins, in about 2 series; scales of the pappus 5–7, ovate, nearly awnless.—*Nutt.! in trans. Amer. phil. soc. l. c.*, excl. syn.

Shelving rocks on the lofty hills or mountains of the Upper Platte called the "Three Buttes," *Nuttall!* June.—Plant 2–3 inches high. Leaves a line wide, rigid. Heads rather smaller than in the preceding. Rays rather large, 8–10. Receptacle conical.

4. *A. lanata* (Nutt.! l. c.): densely cæspitose, very woolly throughout; leaves clustered, linear-oblanceolate, the primary oblong-spatulate and somewhat glabrous when old, nearly impunctate; scales of the involucre oblong-lanceolate, in about 3 series; the inner with scarious margins; scales of the pappus 5–6, ovate, tipped with short awns.—Actinea integrifolia, *Torr. in ann. lyc. New York, l. c.?* not of Kunth!

With the preceding, which it closely resembles, *Nuttall!* (Rocky Mountains in about lat. 41°, *Dr. James!*) June.—The specimen of A. integrifolia? *Torr. l. c.* is so imperfect that we cannot very confidently refer it to the present species; but it certainly is not the same with the foregoing.

5. *A. glabra* (Nutt.! l. c.): densely cæspitose; leaves narrowly linear or linear-spatulate, nearly glabrous when old, impressed punctate; the dilated scarious bases imbricated on the slender branches of the caudex; scape naked or with a single leaf; scales of the involucre ovate, obtuse, woolly, in about 2 series; scales of the pappus 5, oblong-ovate, lacerate-toothed, nearly awnless, scarcely more than half the length of the corolla.

Near the Shawnee villages on the Missouri, *Nuttall!* On the Platte? *Dr. James!*—Plant 3–5 inches high. Heads smaller than in A. acaulis. Pappus shorter than in any of the preceding species.

6. *A. scaposa* (Nutt.! l. c.): villous; stems leafless, strict, simple, bearing a single head: leaves radical, linear-lanceolate, attenuate at the base, entire, or some of them pinnatifid with a few acute lobes; exterior scales of the involucre obtuse, appressed, shorter than the disk; scales of the pappus oval, abruptly awned, a little shorter than the corolla. *DC.*—Cephalophora (Actinella) scaposa, *DC. prodr.* 5. *p.* 663.

β. linearis (Nutt.! l. c.): cinereous-pubescent, scarcely villous; scapes several from a slender branching caudex, on which the narrowly linear entire and punctate leaves are closely imbricated; scales of the involucre linear-oblong, in about 2 series, silky-villous; achenia sparsely villous.

Texas, in the eastern districts, *Berlandier.* *β.* Texas, *Dr. Riddell!*—The scapes, in the plant described by De Candolle, are 8–12 inches long; the leaves 2–3 inches in length and 2–3 lines in breadth, acute; the rays 4-nerved and 3-toothed. Our plant agrees with this description, except that the leaves are narrower, less hairy, &c.; and the involucre is nearly as long

as the disk. The heads are rather larger than in the following species; the rays 12 or more, bright yellow, elliptical-oblong. The membranaceous scales of the pappus, 5 in number, are roundish-oval, obscurely 1-nerved, and very abruptly awned, the awns short; in the ray similar but awnless.

* * * *Annual: stems branching, diffuse: leaves entire.*

7. *A. linearifolia:* somewhat pubescent with slender spreading hairs; peduncles slender, terminating the spreading branches; leaves narrowly linear, the lowermost oblanceolate, attenuate at base; scales of the involucre oblong, obtuse, pubescent, in 1–2 series; scales of the pappus 5–6, ovate, entire, tipped with slender awns.—Hymenoxys? linearifolia, *Hook. ic. pl. t.* 146; *DC. prodr.* 7. *p.* 243.

Texas, *Drummond!* Western Louisiana or Arkansas, *Dr. Leavenworth!* —Plant slender, 6–12 inches high. Heads one-half to two-thirds of an inch in diameter, including the 8–9 rather large obovate-oblong rays, which are apparently pale yellow. Receptacle conical. Achenia villous. The heads exhale the odor of Chamomile when bruised, as in Hymenoxys. Although an annual, it is doubtless a congener of the preceding species.

126. AMBLYOLEPIS. *DC. prodr.* 5. *p.* 667.

Heads many-flowered, radiate; the ray-flowers ligulate, pistillate, in a single series, 3-cleft at the apex; those of the disk tubular, perfect. Scales of the involucre in two series; the exterior 6 or 7, ovate, acute, foliaceous, appressed, as long as the disk; the inner roundish-obovate, very obtuse, hyaline, nerveless. Receptacle flattish, alveolate. Corolla of the disk with a short tube and an inflated throat, 5-lobed; the lobes lanceolate, callous-apiculate. Anthers with long acute appendages. Branches of the style not appendiculate. Achenia turbinate, very villous with appressed hairs. Pappus of 5 very obtuse nerveless scales in a single series, as long as the tube of the corolla.—An annual erect and simple herb, sparingly hairy along the stem, the margins of the leaves, and the scales of the involucre. Leaves alternate, partly clasping, not decurrent, oval-lanceolate, nearly entire. Heads terminal, solitary, of the size and aspect of Pyrethrum Myconis. Flowers yellow. *DC.*

A. setigera (DC. l. c.)

Texas, between Bexar and Austin, *Berlandier.*—A foot high. Leaves few; the lower obtuse, the upper acuminate, *DC.*—We have seen this plant only in the herbarium of De Candolle.

127. HELENIUM. *Linn.; Lam. ill. t.* 688; *DC. prodr.* 5. *p.* 665.

Heads many-flowered, radiate; the ray-flowers in a single series, pistillate, ligulate, cuneiform, 3–5-cleft at the summit, nearly or quite destitute of a tube. Scales of the involucre in 2 series; the exterior linear or subulate, foliaceous, spreading or reflexed; the interior fewer and much shorter, chaffy. Receptacle convex, globose, or oblong, naked. Corolla of the disk with an extremely short proper tube, and a cylindraceous inflated 4–5-toothed throat;

the teeth very short and obtuse, glandular-bearded. Branches of the style slightly dilated and obtuse at the apex. Achenia obovate-turbinate, striate or ribbed, villous on the ribs. Pappus of 5–8 membranous apiculate or awned somewhat 1-nerved scales.—Erect branching (North American and Mexican) herbs; with alternate minutely punctate leaves, decurrent on the striate-angled stem and branches. Heads terminating the branches. Flowers yellow, or the rays (minutely pubescent beneath) rarely purplish-brown towards the base, and the corolla of the disk often brownish or purplish at the summit, sprinkled with bitter resinous globules.

§ 1. *Receptacle convex or globose: corolla of the disk mostly* 5*-toothed.*—Helenia, *Linn., Gærtn.*

1. *H. autumnale* (Linn.): glabrous or minutely pubescent; leaves lanceolate, serrate, or the uppermost entire; acute, strongly decurrent; scales of the involucre linear-subulate; rays flat, 3–5-cleft at the apex, longer than the globose disk; scales of the pappus ovate or ovate-lanceolate, somewhat lacerate, acuminate-awned, about one-third or one-fourth the length of the corolla. —*Linn.! spec.* 2. *p.* 866; *Michx.! fl.* 2. *p.* 133; *Lam. ill. t.* 688; *Schkuhr, handb. t.* 250; *Pursh, fl.* 2. *p.* 560; *Ell. sk.* 2. *p.* 316; *Bart. fl. Amer. Sept. t.* 26; *Darlingt.! fl. Cest. p.* 487; *Hook. bot. mag. t.* 2994. & *fl. Bor.-Am.* 1. *p.* 317; *DC.! prodr.* 5. *p.* 666. H. pubescens, *Ait. Kew.* (*ed.* 1) 3. *p.* 287.

β. grandiflorum: scales of the pappus narrower and more awned, one-third to two-thirds the length of the corolla (rays not tubular).—H. autumnale, *Hook.! l. c.*, partly. H. grandiflorum, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 384. H. montanum, *Nutt.! l. c.*

γ. tubuliflorum: scales of the pappus lanceolate, acuminate-awned, half the length of the corolla; rays tubulose, unequally 5-cleft.—H. tubuliflorum, *DC.! l. c.*—Probably an accidental state of var. *β.*; as some of the rays are flat and not at all tubular in an authentic specimen.

δ. canaliculatum: scales of the pappus ovate, either acutish, acuminate, or slightly awned, about one-fourth the length of the corolla: rays concave-canaliculate or 3-sulcate.—H. canaliculatum, *Lam. in jour. hist. nat.* 2. *p.* 213, *t.* 35?

In wet or alluvial soil, nearly throughout North America, from Florida and Georgia! to Hudson's Bay! Subarctic America! and west to Oregon! Aug.-Oct.—2f Stem 1–3 feet high, loosely corymbose-paniculate at the summit. Leaves &c. bitter, as in all the species of the genus. Rays drooping. Disk one-third to two-thirds of an inch in diameter, greenish-yellow. Achenia hairy or villous on the angles.—Some of our varieties are possibly species; but they accord in every thing but the pappus, which also presents every intermediate gradation. The var. *β.* is the only state we have seen from Oregon, Saskatchawan, &c.: but a state with a nearly similar pappus is common in New York; while other specimens, otherwise undistinguishable, present a reduced and merely acute pappus.—*Sneeze-weed.*

2. *H. parviflorum* (Nutt.): glabrous; stem much branched, slightly angular; leaves lanceolate or oblong-lanceolate, here and there subserrulate, scarcely decurrent; scales of the involucre filiform, shorter than the globose disk; rays flat 3-toothed, narrow; achenia rather smooth; pappus awned, half the length of the corolla; heads scattered, solitary or in pairs. *Nutt.! in trans. Amer. phil. soc. l. c.*

"Georgia.—A very distinct and well-marked species, scarcely at all bitter to the taste. Flowers scattered, not fastigiate, scarcely half the size of those

of H. autumnale, to which this species has an affinity; the leaves are also generally entire and scarcely decurrent. Rays slightly pubescent externally." *Nuttall.*—We have only seen cultivated specimens: in these the ribs of the achenium are villous with long scattered hairs.

3. *H. tenuifolium* (Nutt.): fastigiately much branched, nearly glabrous; leaves crowded and usually fascicled, very narrowly linear, entire; scales of the involucre subulate; rays rather longer than the globose disk: scales of the pappus ovate, entire, crowned with abrupt awns, nearly equalling the corolla.—*Nutt.! in jour. acad. Philad.* 7. *p.* 66; *Hook.! compan. to bot. mag.* 1. *p.* 98.

Fields and road-sides, Mississippi! Louisiana! and Arkansas! "A common and troublesome weed, imparting a bitter taste to the milk of cows that feed upon it." *Dr. Hale!* April–Nov.—2f Plant 8–20 inches high, very leafy. Disk 3–4 lines in diameter, yellow. Achenia villous.

§ 2. *Receptacle oblong or conical: corolla of the disk mostly* 4-*toothed.*—

Tetrodus, *Cass.*

4. *H. puberulum* (DC.): minutely cinereous-puberulent; leaves oblong-lanceolate, entire; the upper acute or acuminate; the lower obtuse, sometimes incised; heads terminating the simple naked branches; rays and involucre very short; disk globose; scales of the pappus ovate, cuspidate-acuminate, somewhat denticulate or lacerate, rather shorter than the achenia.—*DC. prodr.* 5. *p.* 667. H. pubescens, *Hook. & Arn. bot. Beechey, p.* 149, & *suppl. p.* 355; not of *Ait.* H. Californicum, *Link, ind. sem. hort. Berol.* 1840? Cephalophora decurrens, *Less. in Linnæa*, 6. *p.* 517; *DC. l. c. p.* 663.

California, *Chamisso, Douglas!* &c.—①? A larger plant than H. quadridentatum, sprinkled with resinous globules; the disk nearly half an inch in diameter. Corolla of the disk brownish-purple at the tips. Rays yellow, pubescent. Achenia villous on the ribs; the pubescence and the pappus tawny.

5. *H. quadridentatum* (Labill.): somewhat glabrous, much branched; radical and lower leaves oblong-pinnatifid; the upper coarsely 1–2-toothed on each side; the uppermost lanceolate, entire; involucre and rays shorter than the ovoid-oblong disk; scales of the very short pappus roundish-oval, obtuse.—*Labill. in act. soc. nat. hist. Par.* 1. *p.* 22, *t.* 4; *Lam. ill. t.* 688; *Bot. reg. t.* 598; *Pursh, fl.* 2. *p.* 560; *DC.! prodr.* 5. *p.* 666. Rudbeckia alata, *Jacq. ic. rar.* 3. *t.* 593.

Moist soil and banks of rivers, Louisiana! Mississippi! and Arkansas! common. June–Aug.—① Plant 1–3 feet high; the stems and branches broadly winged. Heads small: the disk yellow. Achenia minutely pubescent.

6. *H. microcephalum* (DC.): glabrous [or minutely puberulent]; stem erect, very much branched, bearing many heads; leaves lanceolate, entire, somewhat punctate; involucre very short; rays 3-toothed (yellow) glabrous; pappus very short, obtuse. *DC. prodr.* 5. *p.* 667.

β. *bicolor*: rays purplish-brown towards the base, yellow at the apex; leaves manifestly punctate.—H. elegans, *DC. l. c.?*

Texas? between Lando and Bexar, *Berlandier.* (Heads subrotund, 3 lines in diameter, *DC.*) Texas or Arkansas, *Mr. Beyrich!* (*Dr. Leavenworth.*) β. Texas, *Drummond!*—Plant 2–4 feet high; the minutely puberulent branches bearing numerous corymbose heads; the globose disk 3 lines in diameter. Rays much longer than the subulate scales of the involucre, about the length of the disk, glabrous or nearly so; the receptacle depressed-

conical. Corolla of the disk brownish-purple at the apex. Achenia minutely pubescent. Lower leaves oblong, triplinerved, tapering to the base; the upper lanceolate-linear, strongly decurrent.

H. Mexicanum (H. B. & K.) is said by Nuttall (*in trans. Amer. phil. soc. l. c.*) to have been collected in Louisiana by Mr. Teinturier. We have seen no specimens which accord with the Mexican plant.

H. longifolium (Smith): leaves linear-lanceolate, entire, very smooth; peduncles naked, elongated. *Smith in Rees, cycl.* H. autumnale, *Mill. dict. ed.* 8, ex *Smith.*

H. pumilum of Willd. (*Enum. suppl. p.* 60,) of unknown origin, is at present not known either in the Berlin Garden or in the herbarium of Willdenow.

H. quadripartitum (Link, enum. 2. p. 338) is probably a state of H. quadridentatum.

H. altissimum of Link, is described in the Index Seminum of the Berlin Garden for 1840 (fide *Linnæa*, 15. *suppl. p.* 83) from a plant raised from seeds sent by Dr. Engelmann of St. Louis: we have not seen the description.

H. commutatum, Link, l. c. is also said to be a new species from North America.

128. LEPTOPODA. *Nutt. gen.* 2. *p.* 174; *Ell. sk.* 2. *p.* 445.

Heads many-flowered, radiate; the ray-flowers in one or more series, ligulate, cuneiform, 3–4-cleft at the summit, nearly or quite destitute of tube, neutral. Scales of the involucre in 1–2 series, spreading or reflexed; the exterior numerous, foliaceous, lanceolate-subulate; the inner very short, chaffy. Receptacle conical or hemispherical, naked, areolate; the areolæ becoming fleshy. Corolla with a short narrow tube, and an elongated cylindraceous 4–5-toothed throat; the teeth short and obtuse, glandular-bearded. Branches of the style short, slightly dilated and truncate at the apex. Achenia short, truncate at each end, somewhat cylindrical or turbinate, many-striate. Pappus of 6–12 (rarely 5) membranous and silvery oblong (mostly nerveless and awnless) scales, denticulate, lacerate, or fimbriate, longer than the achenia.—Perennial (North American) herbs, with the habit &c. of Helenium; but usually with simple fistulous stems, naked above, and terminated by a solitary large head. Flowers of the ray and disk yellow or sometimes brownish-purple, sprinkled with resinous globules; the former mostly pubescent externally.

The first section of the genus is somewhat peculiar in habit: the second is only to be distinguished from Helenium by its neutral rays.

§ 1. *Stems mostly simple, naked at the summit, and terminated by a single large head: rays numerous* (12–40), *spreading: pappus awnless: peduncle commonly dilated or obconical under the head.*—LEPTOPODA proper.

* *Achenia glabrous, glandular-dotted: scales of the pappus slightly thickened or obscurely nerved at the base.*

1. *L. Helenium* (Nutt.): glabrous, or when young sometimes pubescent at the summit; leaves lanceolate or linear-lanceolate, elongated, entire, or often denticulate, mostly decurrent; the radical and lowermost tapering into

petioles; scales of the pappus lacerate, especially near the summit, often somewhat pointed with a central bristle; rays 20–30 in a single series.—*Nutt. gen. 2. p.* 174; *DC. l. c.* L. Helenium & denticulata, *Nutt. in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 373. L. decurrens, *Macbride, in Ell. l. c.*

South Carolina! and Georgia! to Florida! Alabama! and Louisiana! in wet soil, like all the species. March–April.—Stem 1–2 feet high. Lower cauline leaves 4–7 inches long, 1-nerved; the primordial small. Heads an inch and a half in diameter, including the rays.

2. *L. incisa:* glabrous; leaves lanceolate, rather obtuse, sessile, not decurrent, sinuate-pinnatifid or incised; scales of the pappus lacerate or slightly fimbriate at the summit; rays about 40 (always?) in a double or triple series.

Georgia, *Mr. L. Le Conte!*—Plant with the habit of L. puberula, and with the incised or pinnatifid leaves so common in that species; but the achenia perfectly glabrous, strongly striate; the pappus nearly as in L. Helenium. Involucre glabrous, very short. The rays in the only specimen we possess are in 2 or more series.

* * *Achenia hairy on the angles: pappus nerveless.*

3. *L. fimbriata:* glabrous or nearly so; leaves lanceolate or linear-lanceolate, acute, entire or remotely denticulate, often decurrent; the lower elongated; the radical oblanceolate; scales of the pappus deeply fimbriate-cleft into capillary segments.—Galardia fimbriata, *Michx. fl. 2. p.* 142?

East Florida, *Dr. Leavenworth!* Texas, *Drummond! Dr. Leavenworth!* growing in wet soil, and in pine barrens along streams, like all the other species. April–May.—Stem occasionally forked above, 1–2 feet high. Leaves resembling those of L. Helenium. Rays rather numerous, in a single series. Receptacle oblong-conical. The scales of the silvery pappus are fully half the length of the corolla, and beautifully dissected about to the middle into a capillary fringe.—This is very probably not the Galardia fimbriata of Michaux, although it best accords with his character; but, since that name cannot properly be employed for either of the species already described, it may in any case be adopted for the present very distinct species, for which it is very appropriate.

4. *L. puberula* (Macbride): stem tomentose-pubescent and somewhat viscid; leaves linear-lanceolate (thickish), often toothed; the cauline not decurrent; the radical sometimes obovate-lanceolate, often incised; scales of the pappus obtuse, lacerate-denticulate at the summit, or nearly entire.—*Macbride, in Ell. sk. 2. p.* 445, (excl. syn. (*Michx?*); *DC. l. c.* Helenium vernale, *Walt.*, fide *Ell.*

β. *pinnatifida:* radical and lower cauline leaves incisely toothed or pinnatifid.—L. pinnatifida, *Schwein.! herb.; Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 372.

North Carolina! to Georgia! and Florida! April–May.—Stem 1–2 feet high, usually fistulous. Head, including the 20–30 rays, often 2 inches in diameter.

5. *L. brevifolia* (Nutt.): stem glabrous below, minutely pubescent at the summit; leaves all entire or obscurely denticulate; the lower and radical oblong-spatulate, obtuse; the cauline more or less decurrent; the uppermost lanceolate, often acute; scales of the pappus obtuse, slightly denticulate or lacerate at the summit.—L. puberula, *Ell. l. c.*, partly.

β. stem stouter and taller; leaves larger; the cauline more strongly decurrent.—L. integrifolia, *M. A. Curtis! mss.*

North Carolina! to Alabama! common. β. Raleigh, N. Carolina, *Mr. Curtis!* May–June.—Stem 1–3 feet high, not unfrequently slightly branched

at the summit, bearing 2 or 3 heads. Primordial radical leaves often sessile, 1–2 inches long; the succeeding sometimes larger; the upper cauline also small: but in var. *β*. all are larger. Heads 12–18 lines in diameter, including the numerous (12–25) rays. Disk-flowers brown at the summit, or often pale.

§ 2. *Stem leafy, corymbose at the summit; the heads on short peduncles: rays* 8–12, *drooping* (*very rarely furnished with an abortive style or with sterile filaments*).—PSEUDO-HELENIUM.

6. *L. brachypoda:* minutely pubescent, or glabrous below; stem fastigiate-corymbose at the summit; leaves decurrent, lanceolate or oblong-lanceolate, entire or denticulate; the upper acute; scales of the involucre linear-lanceolate, shorter than the globose brownish-purple disk, about half the length of the golden yellow rays; scales of the pappus ovate, somewhat denticulate, mucronate or abruptly cuspidate-awned: achenia hairy on the angles.—Helenium quadridentatum, *Hook.! compan. to bot. mag.* 1. *p.* 98; *Croom! cat. pl. New Bern. p.* 44; not of *Labill. &c.* H. nudiflorum & H. micranthum, *Nutt.! in trans. Amer. phil. soc. l. c. p.* 385.

β. rays dark orange or brownish-purple.—H. purpureum, *Hale! mss.*

Damp soil. North Carolina! to Georgia! and Florida! and from Illinois! to Louisiana! Arkansas! and Texas! apparently common. April–July.—Plant 1–3 feet high, commonly slender and simple below, often much branched; the radical leaves often toothed. Disk 4–6 lines in diameter. Receptacle ovoid. Rays irregularly and often deeply cleft, one-half to three-fourths of an inch long. Corolla of the disk 4–5-toothed. Pappus sometimes scarcely pointed, but mostly tipped with a mucronate point or short awn.—The variety with brown-purple rays is apparently confined to the South-Western States, and is not constant. The rays are entirely sterile; but in one or two instances we have observed an abortive style in a portion of the rays, while the others were neutral. The aspect of this somewhat variable plant is entirely that of Helenium: but as the sterile rays afford the only available character of Leptopoda, we are obliged to retain it in the latter genus.

Div. 2. BALDWINIEÆ.—Receptacle very deeply alveolate; the cartilaginous alveoli consisting of united chaff? enclosing the achenia. Rays neutral.

129. BALDWINIA. (Baldwina,) *Nutt. gen.* 2. *p.* 175 (partly); *Ell. sk.*

Heads (subglobose in fruit) many-flowered; the ray-flowers 20–30, ligulate, neutral, in a single series; those of the disk tubular, perfect. Involucre campanulate, scarcely as long as the disk; the scales imbricated in about 4 series, short and thick, appressed, or at length somewhat squarrose; the innermost longest, mucronate-acuminate. Proper receptacle convex-conical, covered with cartilaginous chaff entirely concreted, and forming 5–6-angular cells or deep alveoli, the margins nearly truncate and entire. Rays narrowly cuneiform-oblong, 3-toothed at the apex. Corolla of the disk with a short corneous tube, and a cylindrical 5-toothed limb; the teeth glandular-puberulent. Branches of the style flattish, crowned with a ring or tuft of collecting hairs, and terminated by a subulate cone. Achenia immersed in the cells, cylindrical-obconical, silky-villous. Pappus of 7–9 lanceolate-oblong

nerveless erect chaffy scales in a single series, as long as the corneous tube of the corolla, and about the length of the achenium.—A perennial puberulent herb, with a simple or rarely somewhat branched striate stem, naked at the summit. Leaves alternate, rather thick, minutely punctate, short, linear-spatulate, sessile, entire. Head large, solitary. Corolla of the disk and ray yellow, punctate with resinous dots. Anthers yellowish-white.

B. uniflora (Nutt.! l. c.)—*Ell. sk.* 2. *p.* 147; *DC.! prodr.* 5. *p.* 653. Ceranthea, *Le Conte! mss.*

Margin of swamps, Virginia, near the coast, S. Carolina! Georgia! Florida! and Covington, Louisiana! July–Sept.—Stem about 2 feet high. Leaves obscurely 1-nerved. Head, including the rays, nearly 2 inches in diameter; the exterior involucral scales oval, obtuse. Receptacle resembling honey-comb; the cells 4 lines in depth, including the (not stipitate) achenia and pappus.—The remarkable genus Baldwinia (as it should be written) was named in commemoration of the late Dr. Wm. Baldwin; a botanist of distinguished talents and indefatigable zeal, in whose early death natural science in this country sustained a severe loss. The genus may well be restricted to the present species, as proposed by Elliott; who, however, probably mistook the appressed silky hairs at the summit of the achenium for a fimbriate exterior pappus.

130. ACTINOSPERMUM. *Ell. sk.* 2. *p.* 448, under Baldwinia.

Heads (hemispherical in fruit) many-flowered; the ray-flowers 8–10, ligulate, neutral; those of the disk tubular, perfect. Involucre much shorter than the disk; the scales imbricated in about 2 series, lanceolate, somewhat foliaceous, squarrose; the interior mucronate-acute. Proper receptacle small, covered with cartilaginous subulate-cuspidate chaff, concreted and forming somewhat hexangular cells, in which the achenia and pappus are deeply immersed. Rays narrowly cuneiform, elongated, 3-toothed at the apex. Corolla of the disk with a somewhat expanded deeply 5-toothed limb (the teeth glandular-puberulent), becoming indurated at the very base; the proper tube almost none. Style &c. as in Baldwinia. Achenia turbinate, silky, stipitate, flat and 12-radiate at the summit, and crowned with a short cup-shaped pappus of about 12 orbicular-obovate nerveless scales, which are slightly thickened at the base.—An annual or biennial? slender corymbosely much branched herb, glabrous, or when young often hirsute with scattered jointed hairs; the slender branches naked at the summit, and terminated by small but showy heads, with somewhat the aspect of a Coreopsis; the bright yellow rays 3–4 times the length of the involucre. Disk-corolla and anthers yellow, sprinkled with resinous globules. Leaves very numerous, alternate or irregularly scattered, often much crowded, narrowly linear, obtuse, tapering to the base, sessile, thickish, impressed-punctate, nerveless.

A. angustifolium.—Buphthalmum angustifolium, *Banks! herb.*; *Pursh! fl.* 2. *p.* 564. Baldwina multiflora, *Nutt.! gen.* 2. *p.* 176; *Ell.! l. c.*; *DC. prodr.* 5. *p.* 653.

Sand hills of Georgia and Florida, *Bartram! Baldwin! Mr. L. Le Conte! Dr. Chapman! Dr. Leavenworth!* Aug.–Sept.—Stem 1–3 feet high.

Leaves less than a line wide, often almost filiform; those of the branchlets scattered. Rays 6–9 lines long. Cells of the receptacle deeper in proportion than in Baldwinia; the immersed achenia exhibiting nothing but their radiated summits nestling in the cavities, and resembling some of the starry Madrepores, as Elliott remarks. The minute chaffy scales of the pappus are inserted by a narrow thickened base, and spread, like the petals of a rosaceous flower, from the flat summit of the exactly turbinate achenium.

Div. 3. GALINSOGEÆ, *DC.*—Receptacle chaffy throughout; the chaff distinct. Scales of the involucre not enclosing the ray-achenia. Rays fertile or neutral, or none.

Galinsoga parviflora, Cav. is somewhat naturalized near Boston, having doubtless escaped from the Botanic Garden at Cambridge, as it has done from several European gardens: we have also found it in a waste field near Princeton, New Jersey.

131. MARSHALLIA. *Schreb. gen.* 2. *p.* 810; *Cass.*; *DC. prodr.* 5. *p.* 680.

Persoonia, *Michx.*—Trattenickia, *Pers.*—Therolepta, *Raf.*

Head many-flowered; the flowers all tubular and similar, perfect. Scales of the involucre linear-lanceolate, foliaceous, in 1–2 series, erect, about the length of the disk. Chaff of the convex or conical involucre narrowly linear, rigid or herbaceous. Corolla pubescent, with a filiform tube and a 5-parted (occasionally somewhat bilabiate) limb; the lobes long and linear, spreading. Branches of the style slender, slightly pubescent, truncate at the apex. Achenia turbinate, somewhat 5-angled, mostly hairy or villous. Pappus of 5 or 6 ovate or triangular-lanceolate acute or acuminate nerveless membranaceous scales.—Perennial (North American) herbs; with alternate entire and glabrous 3-nerved leaves (the lower more or less petioled and sheathing at the base), and solitary heads (resembling those of Scabiosa) terminating the simple stem or branches. Flowers pale purple or rose-color; the anthers blue.

1. *M. latifolia* (Pursh): stem simple or sparingly branched above, leafy; leaves ovate-lanceolate, acuminate, sessile, 3-nerved; scales of the involucre linear-lanceolate, acute, rigid; chaff subulate-filiform; achenia glabrous when mature; scales of the pappus attenuate-acuminate from a lanceolate-triangular base.—*Pursh! fl.* 2. *p.* 519; *Nutt. gen.* 2. *p.* 140; *Ell. sk.* 2. *p.* 316; *DC. l. c.* M. Schreberi, *Tratt. arch. gen.* 1. *p.* 108, with a figure copied from that of *Michaux*. Athanasia trinervia, *Walt.! Car. p.* 201. Persoonia latifolia, *Michx.! fl.* 2. *p.* 105, *t.* 43. Trattenickia latifolia, *Pers. syn.* 2. *p.* 403.

Dry soil, Virginia! to Alabama! along or near the mountains. May–June.—A foot high, glabrous. Leaves about 2 inches long, and three-fourths to one inch broad. Pappus tawny.

2. *M. angustifolia* (Pursh, l. c.): stems somewhat cæspitose, often branching above, leafy; radical leaves narrowly lanceolate, acute, 3-nerved; the upper cauline linear, very narrow; scales of the involucre linear-lanceolate, acute, rigid; chaff filiform-setaceous; achenia minutely hairy on the angles; scales of the pappus ovate-lanceolate, acuminate.—*Ell. sk.* 2. *p.* 316 (& var. cyananthera); *DC.! l. c.* Persoonia angustifolia, *Michx.! l. c.* Trattenickia angustifolia, *Pers. l. c.* Athanasia graminifolia, *Walt.! Car. p.* 201.

Pine woods, &c., North Carolina! to Florida! Tennessee, and Western Louisiana! June–Aug.—A foot high, somewhat pubescent at the summit. Lowest leaves 3–6 inches long, petioled; the uppermost linear-setaceous; all rigid. Involucre shorter than the disk. Scales of the pappus somewhat denticulate, very obscurely 1-nerved.

3. *M. lanceolata* (Pursh! l. c.): stem simple, very leafy near the base, naked above; leaves lanceolate or oblanceolate, mostly obtuse, triplinerved, tapering into petioles, the upper sessile; scales of the involucre oblong-linear, obtuse; chaff linear and somewhat dilated at the apex; achenia pubescent; scales of the pappus ovate, acuminate.—*Ell. sk.* 2. *p.* 315; *DC.! l. c.* Persoonia lanceolata, *Michx.! l. c.* Trattenickia lanceolata, *Pers. l. c.* Athanasia obovata, *Walt.! l. c.*

Upper districts of North Carolina! to Middle Florida! April–June.—Stems 10–20 inches high, a little pubescent near the summit. Pappus tawny, somewhat denticulate, cuspidate-acuminate.

4. *M. cæspitosa* (Nutt.): stems mostly simple, cæspitose, leafy only at the base; leaves lanceolate-linear, rather obtuse, obscurely 1–3-nerved, somewhat petioled; scales of the involucre oblong-linear, obtuse; chaff linear and somewhat dilated at the apex; achenia villous (at least on the nerves); scales of the pappus ovate, scarcely acute.—*Nutt.! in DC. prodr.* 5. *p.* 680: *Hook. bot. mag. t.* 3704.

Woods and moist prairies, Arkansas & Western Louisiana, *Nuttall! Dr. Leavenworth! Dr. Hale! Dr. Engelmann!* Texas, *Drummond!* May–June.—Plant 6–10 inches high, with much the aspect of an Armeria; the leaves (2–3 inches long, & 2–3 lines wide) all crowded at the base of the simple scape-like stem. Pappus conspicuous, tawny; the scales so broad as to overlap, often lacerate-denticulate near the summit, not pointed.

132. BLEPHARIPAPPUS. *Hook. fl. Bor.-Am.* 1. *p.* 316. (excl. spec.)

Ptilonella, *Nutt.*

Heads few-flowered; the ray-flowers about 3, ligulate, short, dilated cuneiform, 3–5-lobed, pistillate, and sometimes with rudimentary stamens; those of the disk (7–9) tubular, perfect; the central ones infertile. Scales of the involucre 6–8, in a single series, oblong, equal, concave, with somewhat involute membranaceous margins. Receptacle small, furnished with a marginal series of membranaceous chaff, partly embracing the fertile disk-flowers. Corolla of the disk glabrous, with a short tube and an expanded throat, 5-toothed. Style in the disk-flowers hairy and slightly thickened above the middle; the branches extremely short and obtuse, thick, glabrous, not appendiculate, the stigmatic lines confluent at the summit! Achenia obconical or clavate, villous. Pappus of 12 to 20 membranous pectinate-plumose narrow scales, shorter than the corolla.—An annual slender (aromatic) plant; with nearly glabrous diffusely branched and corymbose stems, narrowly linear entire and scabrous alternate and crowded leaves, and small heads terminating the branchlets: the involucre, branchlets, and upper leaves glandular-viscid. Rays and disk-flowers white: anthers brownish-purple.

B. scaber (Hook. l. c.)—*DC. prodr.* 5. *p.* 679. Ptilonella scabra, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 386.

Prairies and sandy plains of Oregon, east of Wallawallah, *Douglas! Nuttall!*—About a foot high. Cauline leaves an inch long, half a line wide.

Heads 3 lines long. Rays scarcely longer than the disk, sometimes palmate and furnished with stamens: the branches of the style linear.—The style of the disk-flowers is very peculiar, and more like that of the Cynareæ than of the present tribe.—De Candolle's character of Blepharipappus, made by combining the description of Hooker's two species, is consequently inapplicable to either. The division of the genus was proposed by Arnott, in the second edition of Lindley's Introduction to the Natural System, and also in the Supplement to Capt. Beechey's Voyage (p. 358); retaining the name for the present species.

Div. 4. MADIEÆ, *DC.*—Receptacle chaffy throughout, or only at the margin; the chaff often more or less united. Scales of the involucre convolute or complicate and enclosing the (fertile) achenia of the ray, which are always destitute of pappus. (Natives of Chili, California, and Oregon.)

133. ACHYRACHÆNA. *Schauer, del. sem. Vratis,* 1837; *DC. l. c.*

Head many-flowered; the ray-flowers sterile, small, somewhat ligulate, or cleft on one side, retaining the rudiments of stamens and style; those of the disk perfect, 5-cleft. Scales of the involucre in a double series, lanceolate; the exterior foliaceous, somewhat convolute and including the ray-flowers; the inner plane, with scarious margins. Receptacle flat, bearing a series of chaffy scales between the ray and disk; otherwise naked, alveolate and somewhat fimbrillate. Anthers not caudate; the antheriferous joint rather long. Branches of the style nearly terete, puberulent. Achenia elongated, attenuate at the base, longitudinally striate, scabrous along the nerves; in the ray destitute of pappus; in the disk crowned with an ample pappus of 10 membranaceous obtuse scales in 2 series; the 5 exterior scarcely half the length of the inner; the latter when young convolute around the tube of the corolla.—A villous herb [annual], with somewhat the habit of Hecubæa or Scorzonera, rather canescent; some of the hairs long, others very short and perhaps glandular. Stem nearly simple, naked at the summit and bearing a single head. Leaves alternate, linear, sessile, entire. Corolla with a long tube, in the dried specimens purple. *DC.*

A. mollis (Schauer, l. c.)—*Linnæa,* 12. *suppl. p.* 87; *DC. prodr.* 7. *p.* 292. Lepidostephanus madioides, *Bartl. ind. sem. hort. Gœtt.* 1837, & *in Linnæa, l. c. p.* 82, & 15. *p.* 94.

Western coast of North America, probably from California, *Douglas.* Described by De Candolle apparently from the wild plant, in 1838; but the genus founded the year preceding, both by Schauer and Bartling, on specimens cultivated in the Botanic Gardens of Breslau and Gœttingen. According to Schauer, the scales of the involucre are in a single series, as many as the short 3-toothed rays (5–10), and the somewhat foliaceous chaff in 2 series: the inner scales of the white and scarious pappus linear, obtuse, slightly fimbriate at the apex, as long as the flowers: the stems somewhat branched: the oblong 20–30-flowered heads almost an inch long. According to Bartling, the head is about half an inch long; the rays 3–5, at first yellow, at length fuscous; the pappus shining, denticulate under a lens. The genus would appear to rank next to Chænactis, except that the rays are destitute of pappus, and the receptacle chaffy at the margin.

Dr Asa Gray, M.H.

Bot. 3. p-c. Feb 1843

*** We would here observe, that, since the preceding page was printed, wild specimens of the well-marked ACHYRACHÆNA (California, *Douglas!*) have fallen under our observation; we having casually misplaced them, as De Candolle had done, in Cichoraceæ, with specimens of Calais.

134. LAYIA. *Hook. & Arn. bot. Beechey, p.* 148 (1833), & 357; not of *p.* 182.

Eriopappus, *Arn.* (1836)—Madaroglossa, *DC.* (1836)—Blepharipappus, partly, *Hook.*

Heads many-flowered; the ray-flowers 10–15, ligulate, 2–3-toothed or cleft, pistillate; those of the disk tubular, perfect. Scales of the involucre oblong or lanceolate, acute, equal, in a single series, foliaceous above; the base convolute and enclosing the ray-achenia. Receptacle flat, pubescent, chaffy at the margin; the chaff in a single series between the ray and disk-flowers, and resembling an inner row of involucral scales; or rarely in 2–3 series. Corolla of the disk with a short proper tube and an infundibuliform throat, 5-toothed; the teeth and the tube sparsely hairy. Branches of the style in the disk-flowers filiform, very acute, hairy above, at length exserted and recurved. Achenia of the ray glabrous, linear-oblong, attenuate at the base, or subclavate, more or less obcompressed, somewhat incurved, crowned with a small protuberant disk, destitute of pappus; of the disk linear-clavate, angled, appressed-pubescent or villous, with a pappus of 10–20 equal bristly or subulate awns, which are naked and scabrous-serrulate above, and plumose or villous with very long weak hairs towards the base.—Annual or biennial pubescent or hirsute and often glandular herbs (natives of California and Oregon); with showy heads terminating the branches, and alternate sessile linear or oblong leaves; the upper usually entire, and the lowermost incisely toothed or pinnatifid. Rays yellow or white; the disk-flowers yellow. Anthers brownish or purplish.

Under the name of Layia, this genus was proposed by Hooker & Arnott several years anterior to Madaroglossa, *DC.*; but the authors themselves seem to have forgotten it, as they some time afterwards applied this name to a Chinese Leguminous plant; which however proves to be the Macrotropis of De Candolle. In the supplement to Capt. Beechey's Voyage, *Layia* is continued for the present genus; while, by some inadvertency, these authors also state (in a note on p. 357) that they retain the name for the Leguminous plant.

§ 1. *Rays yellow.*—Madaroglossa, *DC.*

1. *L. gaillardioides* (Hook. & Arn.): decumbent, hispid throughout with rather rigid spreading bristles; leaves oblong-lanceolate; the lower incisely serrate, the upper entire; the flower-branches somewhat elongated; rays 12–15, obovate, 3-cleft at the apex, twice the length of the disk; pappus fulvous. *Hook. & Arn. bot. Beechey, p.* 148 (under Tridax? galardioides), & *suppl. p.* 357.

Monterey, California, *Mr. Lay;* the Naturalist of Capt. Beechey's voyage.—This species (which we have not seen) appears to differ from the others in the more copious linear-oblong chaff of the receptacle, occupying more than one series.

2. *L. hieracioides* (Hook. & Arn. l. c.): hispid throughout with spreading rigid bristles; leaves oblong-lanceolate, coarsely incised-serrate; those of the

flower-branches linear and entire; rays about 15, entire, oval-oblong, a little longer than the disk; pappus fuscous. *DC.*—Madaroglossa hieracioides, *DC. l. c.*

California, *Douglas.*—Plant a foot high, with the habit of an Echium; the bristles arising from a black base. Leaves 2 inches long, 6–7 lines broad. Achenia of the disk a little villous: awns of the pappus villous at the base. *DC.*

3. *L. carnosa* (Nutt.): stem decumbent, hairy towards the summit; leaves succulent, smooth, linear-oblong, incisely toothed; head subsessile, solitary; scales of the involucre linear, obtuse, softly pubescent; rays very small, 2–3-toothed; achenia of the ray and disk pubescent; pappus of 18–20 loosely plumose awns.—*Nutt.! in trans. Amer. phil. soc. l. c. p.* 393, under Madaroglossa.

St. Diego, California, *Nuttall!* on the sands of the sea-coast. May.—Plant 3–4 inches high. Lower leaves oblong-spatulate, the coarse teeth obtuse. Rays scarcely if at all exserted. Pappus as long as the corolla of the disk, whitish.

4. *L. elegans* (Nutt.): stem decumbent, somewhat hirsute, much branched from the base; leaves sparsely hispid, linear-lanceolate; the radical pinnatifid; the cauline laciniate-toothed towards the apex, the uppermost entire; peduncles and involucre somewhat villous and glandular; rays 10–12, 3–4-toothed, longer than the disk; pappus white.—*Nutt.! l. c.*, under Madaroglossa.

St. Barbara, California, *Nuttall!*—Awns of the pappus more densely plumose towards the base than in L. heterotricha, the long and very fine woolly hairs crisped and interlaced; and the yellow rays are smaller than in that species. It appears to differ from L. hieracioides by its larger deeply toothed rays, very woolly white pappus, &c.

§ 2. *Rays white, or nearly so.*—Eriopappus, *Arn.*

5. *L. glandulosa* (Hook. & Arn.): erect, hispid below with rigid spreading bristles; leaves broadly linear, entire; the upper with the peduncles and involucre glandular (some of the glands black and stipitate); rays 12–13, 3-cleft, nearly twice the length of the involucre; pappus very white. (Char. ex *Hook. & DC.*)—*Hook. & Arn. bot. Beechey, suppl. p.* 358. Blepharipappus glandulosus, *Hook. fl. Bor.-Am.* 1. *p.* 316. Eriopappus glandulosus, *Arn. in Lindl. nat. syst. p.* 443. Madaroglossa angustifolia, *DC. prodr.* 5. *p.* 694, ex *Hook. & Arn.*

Common on the plains of the Oregon, in sandy soil, under the shade of Purshia and Artemisia, *Douglas.* Snake Country, *Mr. Tolmie.* California, [?] *Douglas.*—Plant 6–8 inches high, vaguely branched; the heads nearly as large as in Leucanthemum vulgare. Achenia of the ray glabrous; of the disk villous. *Hook.*—A foot high, with the aspect of Echium. Lower leaves very hispid. Flowers pale yellowish. Achenia of the ray [disk ?] appressed-villous. *DC.*

6. *L. Douglasii* (Hook. & Arn.): somewhat decumbent, clothed with bristly whitish hairs, not glandular; lower leaves pinnatifid-toothed; the upper entire; rays (white) 3-cleft, nearly twice the length of the disk; pappus fulvous. *Hook. & Arn. bot. Beechey, suppl. p.* 358.

Gravelly islands of the Oregon, between the Narrows and the Great Falls, *Douglas.*

7. *L. heterotricha* (Hook. & Arn.! l. c.): stem branching; the upper portion, and the oblong-linear obtuse entire or denticulate leaves somewhat sca-

brous, with a short pubescence, and with stipitate black glands intermixed; rays (white ?) 10–12, large, 3-cleft at the apex, twice the length of the disk; pappus very white.—Madaroglossa heterotricha, *DC.! l. c.; Hook.! ic. pl. t.* 326.

California, *Douglas!*—Plant 1–2 feet high. Leaves 1–2 inches long, 2–3 lines wide. Rays nearly an inch long, probably white. Achenia of the ray glabrous; of the disk appressed villous-pubescent. Awns of the pappus 15–17; the long plumose hairs erect.

135. CALLICHROA. *Fisch. & Meyer, 2nd ind. sem. St. Petersb. p.* 31.

Callichroa & Calliglossa, *Hook. & Arn.*

Heads many-flowered; the ray-flowers 10–15, ligulate, 2–3-toothed, pistillate; those of the disk tubular, perfect. Scales of the involucre oblong or lanceolate, nearly in a single series, foliaceous; the base convolute and enclosing the ray-achenia. Receptacle flat, chaffy at the margin only, or throughout. Corolla of the disk with a short pubescent tube and an infundibuliform throat, 5-toothed. Branches of the style subulate-filiform, hairy above, at length exserted and recurved. Achenia of the ray glabrous, narrowly obovate-oblong, obcompressed, somewhat incurved, crowned with a small protuberant disk, destitute of pappus; of the disk villous, obcompressed, subclavate or narrowly cuneiform-oblong, with a pappus of 12 to 25 subulate and naked serrulate-scabrous awns.—Annual (Californian) herbs, with entirely the habit and aspect of Layia and Oxyura. Flowers yellow; the rays often whitish at the apex. Anthers purplish-brown.

The first section is only distinguished from Layia by the naked, instead of plumose awns of the pappus, and might perhaps be combined with it.

§ 1. *Receptacle naked and pubescent at the centre, chaffy at the margin in one or more series; the exterior resembling the scales of the involucre: achenia narrow: awns of the pappus* (20–25) *setiform, equal.*—CALLICHROA, Fisch. & Meyer.

1. *C. platyglossa* (Fisch. & Meyer, l. c.): somewhat hirsute with slender white hairs, and cinereous with a short pubescence, with small stipitate glands intermixed; leaves linear-lanceolate; the lower incisely pinnatifid, the upper entire or slightly toothed; achenia of the disk slender, slightly obcompressed, villous, when mature rather longer than the pappus; corolla somewhat pubescent.—*Don, Brit. fl. gard. ser.* 2. *t.* 373; *Schauer, del. sem. Vratisl.* 1837, *p.* 3; *DC. prodr.* 7. *p.* 294; *Hook. & Arn. bot. Beechey, suppl. p.* 357; *Hook. bot. mag. t.* 3719. Madaroglossa (Callichroa) hirsuta & angustifolia, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 394.

California, at the Russian Colony Ross, *Fisch. & Meyer*, and at St. Barbara and Monterey, *Nuttall!*—Plant branching from the base, 6–12 inches high. Heads showy, an inch and a half in diameter, including the light bright yellow cuneiform-oblong rays; the latter whitish at the tips in the wild plant, according to Nuttall.—The small and stipitate dark glands are not mentioned in the account of the cultivated plant; with which Mr. Nuttall's specimens otherwise well accord.

§ 2. *Receptacle chaffy throughout; the chaff membranaceous, short: achenia of the disk oblong-cuneiform: awns of the pappus* (*about* 12) *subulate, very unequal.*—CALLIGLOSSA, Hook. & Arn.

2. *C. Douglasii:* stem glabrous below, loosely branched and pubescent above; leaves scabrous-ciliate; the lower pinnatifid, with the linear segments entire or sparingly incised; the uppermost linear-lanceolate, entire; scales of the involucre hispid on the back with short and stout bristles; achenia of the disk silky-villous; the corolla glabrous.—Calliglossa Douglasii, *Hook. & Arn.! bot. Beechey, suppl. p.* 356. Oxyura chrysanthemoides, *Lindl.! bot. reg. t.* 1850 (as to the figure); *Fisch. & Meyer, 3rd ind. l.c.* 1837, *& in Linnæa,* 12. *suppl. p.* 102; *Schauer, del. sem. Vratisl.* 1837, *p.* 3, *& in Linnæa, l. c. p.* 89; not of *DC.*

California, *Douglas,* (v. sp. cult.)—Plant very much resembling Oxyura chrysanthemoides in aspect, but with narrower and less compressed villous achenia. Awns of the pappus rigid and dilated at the base; 3 or 4 of the longer equal in length to the achenia. Rays whitish at the tips.

136. OXYURA. *DC. in Lindl. nat. syst., & prodr.* 5. *p.* 693.

Tollatia, *Endl.*—Oxyura, *Lindl. bot. reg.* as to descr. only.

Heads many-flowered; the ray-flowers 10–12, ligulate, coarsely 2–3-toothed at the apex, pistillate; those of the disk tubular, perfect; many of the central infertile. Scales of the involucre in a single series, hispid-ciliate, convolute at the base and enclosing the ray achenia, abruptly narrowed above into a linear foliaceous and spreading appendage. Receptacle flat, chaffy throughout; the chaff oval-oblong, membranous, ciliate, with acute herbaceous or colored hairy tips. Corolla with a hairy tube; the infundibuliform limb in the disk-flowers deeply 5-toothed. Branches of the style in the disk-flowers long and linear, very acute, hispid, exserted and revolute. Achenia of the ray and disk similar, glabrous, obovate, obcompressed (with a very small epigynous disk), entirely destitute of pappus; the central often abortive.—An annual erect nearly glabrous herb, with the habit of Chrysanthemum segetum; the branches pubescent at the summit, and terminated by rather large heads. Leaves alternate, pinnatifid; the lobes 4–8 pairs, oblong-linear, entire, short, scabrous-ciliate. Flowers yellow: the anthers blackish.

O. chrysanthemoides (DC.! l. c.)—*Hook. & Arn.! bot. Beechey, suppl. p.* 356; not of *Bot. reg., Fisch. & Meyer, Schauer, &c.*

California, *Douglas!*—Tube of the corolla somewhat dilated at the base, and embracing the apex of the short and flat achenia.—This plant, we believe, has never been cultivated. In the *Mantissa Compos.* (7. *p.* 294), De Candolle has incautiously adduced the syn. of *Lindl. bot. reg., Fisch. & Meyer, &c.;* which belongs to Callichroa (Calliglossa) Douglasii.

137. HEMIZONIA. *DC. prodr.* 5. *p.* 692.

Hemizonia & Hartmannia, *DC.*

Heads several–many-flowered; the ray-flowers 5–20, ligulate, 2–3-lobed, pistillate; those of the disk tubular, perfect, but infertile. Scales of the in-

volucre in a single series, oblong or lanceolate, concave or convolute and partly enclosing the ray-achenia, often subtended by linear bracts. Receptacle flat, chaffy either throughout, or only at the margin and punctate at the centre; the chaff often more or less united. Corolla of the disk-flowers infundibuliform, 5-toothed; the teeth (and often the tube) mostly glandular-bearded. Appendages of the style in the disk-flowers linear or subulate, acute, very hispid. Achenia glabrous; those of the ray obovoid, gibbous, or slightly obcompressed, convex on the back (where it is sometimes rugose or sparsely muricate,) often flattish anteriorly, slightly stipitate; the apex mostly oblique, and terminated with a small often papillose-exserted or beaked areola; of the disk sterile or abortive, oblong, 5–7-nerved. Pappus none; or in the disk-flowers sometimes of 5–8 short and unequal lacerate chaffy scales.—Low annual or perennial hairy and sometimes glandular (Californian) plants; with alternate often crowded lanceolate or linear leaves. Heads (middle-sized) solitary or clustered. Flowers mostly yellow. Anthers brownish.

The achenia of the disk in Hartmannia fasciculata and H. corymbosa are certainly sterile, at least in our specimens, although they contain a rudimentary ovule; as do nearly all the species placed by De Candolle in Hemizonia. Hence the former genus is only to be distinguished by the pappus; which is not well described by De Candolle, and which is said to be partly wanting in one, and entirely so in another of the three species referred to it. The remarkable union of the chaff in some species of Hemizonia, Hartmannia, and Calycadenia, seems also to have escaped De Candolle's observation. Hooker & Arnott have noticed it in Hemizonia, *DC.*; and Nuttall in Hartmannia.

§ 1. *Heads* 10–12-*flowered, corymbose-fasciculate: chaff of the receptacle of* 5 *or* 6 *scales in a single series interposed between the ray and disk-flowers, united to the middle: pappus of the disk-flowers chaffy, lacerate-toothed at the apex: leaves incisely pinnatifid.*

1. *H. fasciculata:* annual, hirsute; stem stout, corymbose above; the small heads numerous, densely fascicled at the summit of the fastigiate branches; leaves linear-lanceolate; the lower pinnatifid; the upper incisely toothed or nearly entire, closely sessile; rays 5, short, obovate-cuneiform; ray-achenia obscurely rugose on the back when old, or slightly muricate; pappus of the disk-flowers of 5–8 oblong chaffy scales, not half the length of the corolla, unequally and very acutely lacerate-toothed at the apex.—Hartmannia fasciculata, *DC.! prodr.* 5. *p.* 693; *Hook. & Arn.! bot. Beechey, suppl. p.* 357. H. glomerata, *Nutt.! in trans. Amer. phil. soc. l. c. p.* 391.

California, *Douglas! Nuttall!* April–May.—A span high. Flowers bright yellow. Disk-flowers enclosed in a 5–6-angular tube or cup, formed by the membranaceous carinate-concave chaffy receptacular scales, which are united (although not very firmly) by their edges at least to the middle; the apex mucronate-acuminate. Fertile (ray) achenia broad at the summit, with a small beak-like areola projecting from the anterior margin: the stipe short and incurved.

§ 2. *Heads many-flowered, somewhat solitary: receptacle chaffy throughout; the scales of the outer series united: pappus of the disk-flowers very small, membranous, fimbriate-lacerate, nearly obsolete* (or *wanting*, DC.) *in the exterior flowers: leaves pinnatifid.*

2. *H. corymbosa:* annual, hirsute-pubescent; heads nearly solitary at the summit of the stem or branches; leaves pinnately parted, tapering into a petiole; the lobes 5–9 pairs, linear, entire; rays 15–20, oblong; ray-achenia obscurely 4-angular, somewhat rugose or muricate on the back; pappus of the disk-flowers of 6–8 hyaline irregularly laciniate very acute scales, about one-fourth the length of the tube of the corolla.—Hartmannia corymbosa, *DC.! prodr.* 5. *p.* 694.

California, *Douglas!*—Nearly a foot high, slender. Chaff scarious; the exterior series united nearly to the acute herbaceous and hairy tips. Achenia stipitate, tipped with a protuberant areola from the inner margin of the apex. Pappus wanting in the exterior disk-flowers, according to De Candolle.

3. *H.? ciliata:* annual, stem somewhat glabrous, loosely branched at the summit, but scarcely corymbose; leaves pinnately parted, with the entire lobes in 5–8 pairs; the lower attenuate into a petiole; the upper (partly clasping) and the floral ones ciliate; heads many-flowered; rays ample, 10–12, obovate; achenia all smooth and destitute of pappus. *DC.*—Hartmannia ciliata, *DC. prodr.* 5. *p.* 694.

California, *Douglas.*—Plant with entirely the habit of the preceding; but the achenia all destitute of pappus and terminated by an areola, and the tube of the corolla obcompressed; therefore approaching the following tribe. Head nearly that of Chrysanthemum Myconis. *DC.*—This ambiguous plant is unknown to us.

§ 3. *Heads many-flowered, solitary or crowded at the summit of the branches: chaff of the receptacle in a single series between the ray and disk-flowers, not united: pappus none: leaves undivided.*

4. *H. angustifolia* (DC.): stem much branched, suffrutescent at the base; the branches, leaves, and involucre minutely pubescent; leaves and bracts narrowly linear, entire; heads bracteate, somewhat solitary; chaff of the receptacle narrow, membranaceous; achenia obovate, not stipitate, the apex mucronate with a short acute cone.—*DC.! prodr.* 5. *p.* 692. H. congesta, *Hook. & Arn. bot. Beechey, suppl. p.* 355*?*

California, *Douglas!*—There appears to be some difficulty in distinguishing these two species by the description. What we have as H. angustifolia agrees with the character of De Candolle, except that the leaves (at least the upper) and the scales of the involucre are clothed with both villous and glandular hairs (just as H. congesta is described); and the chaff is membranaceo-foliaceous. The stipe of the achenium and the terminal areola doubtless vary with age. The (yellow) rays, about 12 in number, are slightly exserted, with the branches of the style very long and filiform: the tube of the disk corolla glandular, as in most species of the genus, and the teeth hispid-bearded on the margin. The leaves are about half an inch long, and obtuse.

5. *H. congesta* (DC.): stem herbaceous, erect, branching; the branches somewhat hispid with soft glandular and glandless hairs; leaves linear-lanceolate, sparsely villous-glandular; heads bracteate, crowded; chaff of the receptacle somewhat coriaceous, foliaceous; achenia obovate, obtuse at the apex, when mature produced at the base into a rostrate stipe, which is strongly recurved, and bears a white areola. *DC. l. c.*—H. multicaulis, *Hook. & Arn. l. c.?*

California, *Douglas.*—Of this we have no specimen, if our H. angustifolia be the true plant. The H. multicaulis, *Hook & Arn.*, which is doubtless the same with one or the other of these species, is said to have an annual or biennial root; the stems somewhat simple, or corymbosely branched at the summit, hirsute with soft spreading hairs; the radical leaves linear-lanceo-

late, serrulate, several-nerved; rather glabrous; the cauline somewhat villous, long and linear, the lower opposite and serrulate; the heads bracteate and in clusters of 2–3: the achenia obovate, obtuse, with an inflexed rostelliform stipe; the chaff only a marginal series.

§ 4. *Heads many-flowered, nearly solitary: receptacle chaffy throughout; the chaff, with the scales of the involucre and the upper leaves, subulate-spinescent: pappus none.*

6. *H. pungens:* herbaceous, somewhat ligneous at the base; stem sparingly branched, setose with whitish hairs; leaves crowded; the lower pinnatifid, with oblong or oblong-lanceolate spinose-mucronate lobes; the upper and those of the axillary fascicles linear, entire, rigid, spinescent, the recurved margins papillose-hairy; heads somewhat solitary, bracteate; scales of the involucre spinescent, glandular, nearly equalling the 2-cleft rays; achenia of the ray gibbous, with a terminal very oblique areola; receptacle wholly chaffy; the chaff lanceolate-subulate, spinescent. *Hook. & Arn.*—Hartmannia? pungens, *Hook. & Arn. bot. Beechey, suppl. p.* 357; *Hook. ic. pl. t.* 334.

California, *Douglas.*—"This is a very remarkable plant, more like a species of Navarettia among the Polemoniaceæ than one of the present order. We can find no trace of it in De Candolle's Prodromus." *Hook. & Arn.*

§ 5. *Heads few–many-flowered, not bracteate, corymbose: receptacle chaffy throughout; the scales of the outer series united: pappus none: leaves glandless, entire or serrulate: flowers white?*

7. *H. filipes* (Hook. & Arn.): stem suffruticose, erect, simple, hirsute with soft hairs; leaves linear, entire, 1-nerved, somewhat hirsute with soft hairs, not glandular; the lower elongated, acuminate, with smaller ones fascicled in their axils; the upper much smaller and bractieform, with black glands; corymb loose; the rather rigid branches filiform and glabrous; heads solitary on long pedicels, few-flowered; scales of the obconical ebracteate involucre few, hirsute; achenia oblong, attenuate at the base. *Hook. & Arn. bot. Beechey, suppl. p.* 356.

California, *Douglas.*—"The corymb is lax, the primary branches bear a few glanduliferous bracteas or leaves; but the stalk that supports the capitulum is slender, quite naked, and rigid. In habit it is very dissimilar to the other species." *Hook. & Arn.*—This species, which is unknown to us, would seem to have many points of resemblance to the Osmadenia tenella of Nuttall.

8. *H. luzulæfolia* (DC.): stem erect, tomentose-canescent, corymbose at the summit; the branches and the involucre hirsute and somewhat viscid; leaves linear-lanceolate, silky-villous, not glandular; the lower elongated, tapering to the base, denticulate, 3–5-nerved, sometimes opposite; involucre hemispherical, many-flowered, nearly bractless; achenia of the ray obovate, obcompressed, somewhat gibbous, with a terminal obtuse sessile areola; those of the disk abortive.—*DC.! prodr.* 5. *p.* 692. H. sericea, *Hook. & Arn. bot. Beechey, l. c.*

California, *Douglas.*—Perennial? herbaceous, 8–12 inches high. Lower leaves 4–5 inches long, 3–4 lines broad, and not unlike those of a Luzula; the appressed silky pubescence becoming loose and villous-tomentose on the old leaves, at length somewhat deciduous: those of the branches or loose corymb one-fourth to half an inch long. Heads 3–4 lines broad; the scales of

the involucre 8–10, rather shorter than the disk. Exterior series of the obtuse membranaceous chaff united nearly to the apex; a portion of the inner also irregularly united with each other, and with the outer series. Rays 8–10, apparently white, a little longer than the disk, broadly cuneiform, deeply 3-lobed (the middle lobe smallest), convolute, with an extremely short thickened and glandular tube: the fertile achenia with a very short incurved stipe, the base of which is dilated into a scarious disk. Corolla of the disk white or yellowish; the chocolate-brown anthers tipped (as in other species) with a broad roundish-deltoid appendage; the ovaries abortive.

§ 6. *Heads many-flowered, somewhat solitary, bracteate: receptacle chaffy throughout; the chaff, as well as the scales of the involucre, glandular-laciniate, distinct or united only at the base: pappus none: leaves entire; the uppermost tipped with a large truncate gland: flowers yellowish-white?*

9. *H. macradenia* (DC.): stem suffruticose, much branched; leaves linear, entire, slightly hairy (as well as the branches), thickish, crowded, with smaller ones often fascicled in their axils; "the lower sparingly serrate" (*DC.*); the uppermost and the numerous bracts tipped with a large and sessile truncate or cup-shaped gland; scales of the involucre and chaff of the receptacle glandular, their margins and back covered with callous cylindrical projections or laciniate teeth, which are terminated by a thick truncate gland; fertile achenia obovate, gibbous, somewhat angled on the back and face, the apex strongly incurved, and terminated by a short ascending beak; those of the disk sterile.—*DC.! prodr.* 5. *p.* 693; *Hook. & Arn.! l. c.*

California, *Douglas!*—This singular plant approaches Calycadenia in habit, as De Candolle remarks; but it is surely by some mistake that it is said to resemble H. luzulæfolia. We find the achenia to accord with De Candolle's description. The heads (half an inch in diameter) are solitary or several, together and nearly sessile at or near the summit of the branches: the broadly cuneiform numerous rays somewhat exserted, 3-lobed at the apex, and raised on a slender glandular-hispid tube. The upper leaves are about half an inch long, half a line broad (rather dilated at the base), with still smaller ones in the axils, tipped with a gland nearly as in Calycadenia.

138. CALYCADENIA. *DC. prodr.* 5. *p.* 695.

Heads many-flowered; the ray-flowers 3–5, pistillate, 3-lobed or 3-parted, with a slender mostly glandular tube; those of the disk tubular, perfect, but mostly infertile. Involucre bracteate at the base; the scales in a single series, concave, partly enclosing the ray-achenia. Receptacle small and flat, naked in the centre, chaffy at the margin; the chaff in a single series between the ray and disk-flowers, distinct or united. Corolla of the disk infundibuliform, 5-toothed. Branches of the style in the disk-flowers with long filiform hirsute appendages. Achenia somewhat hairy; those of the ray obovoid-triangular, destitute of pappus; of the disk quadrangular-obcompressed, tapering to the base, fully formed and ovuliferous, but apparently infertile, with a pappus of 5–10 chaffy and mostly awned scales.—Annual slender (Californian) herbs; with rigid chiefly alternate narrowly linear or subulate 1-nerved leaves, with revolute margins; the floral ones (crowded

on the short branchlets and at the base of the heads, orfascicled in the axils of the cauline leaves) usually terminated by a large, sessile or stipitate, acetabuliform gland. Heads terminal or axillary. Corolla of the disk and ray white: anthers dark brown.

The flowers are apparently white in all the species, not yellow, as stated by De Candolle. The pappus is not mentioned in the generic character of the latter author; whence Endlicher has incautiously introduced the phrase "Pappus nullus."

§ 1. *Stem simple, strict: floral leaves tipped with a large saucer-shaped or nail-headed gland: rays somewhat convolute, unequally and often deeply 3-cleft: teeth of the disk-corolla short, ovate.*—EUCALYCADENIA.

1. *C. truncata* (DC.! l. c.): stem very glabrous; leaves slightly scabrous; the upper cauline, as well as the fascicled floral ones, tipped with a nearly sessile gland; heads terminal and axillary, subsessile, solitary, remote; chaff of the receptacle truncate, scabrous on the back, distinct or nearly so; pappus of 7–10 oblong obtuse scales, incisely toothed at the apex, several times shorter than the corolla or the slightly hairy disk-achenia.

California, *Douglas!*—Stem reddish, shining. Achenia of the ray glabrous, somewhat rugose.

2. *C. villosa* (DC.! l. c.): stem hirsute with white hairs; leaves setose-hispid towards the base; the floral ones, as well as the scales of the involucre, very villous below, mostly tipped with a stipitate gland; heads terminal and axillary, remote, solitary, nearly sessile; chaff of the receptacle acute, hairy towards the apex, often united; achenia villous; pappus of about 10 rigid subulate-awned denticulate-scabrous scales, as long as the disk-corolla.—*Hook. & Arn.! bot. Beechey, suppl. p.* 358.

California, *Douglas!*—Plant slender, about 10 inches high.

3. *C. multiglandulosa* (DC.! l. c.): stem scabrous-puberulent and sparsely hispid; leaves sparsely setose-hispid; the upper cauline tipped with a subsessile gland; the floral ones crowded or fascicled on the very numerous and short axillary branchlets (which bear solitary heads), the back and margins above, as well as the apex, furnished with stipitate glands; scales of the involucre and the united chaff of the receptacle acutish, beset with stipitate glands; achenia glabrous; pappus of about 5 lanceolate subulate-awned scales, and as many intermediate and shorter oblong and obtuse denticulate scales.

California, *Douglas!*—Apparently the largest species; 18 inches or more in height. Cauline leaves 2 inches long. Rays short, very broad, convolute, with a very short tube, deeply 3-lobed; the lobes mucronulate; the middle one much smaller than the others.

4. *C. cephalotes* (DC.! l. c.): stem pubescent above; the heads nearly sessile and crowded at the summit, and sometimes solitary in the upper axils; leaves long and very slender, nearly glabrous, sparsely hispid-ciliate towards the base; the lower sometimes opposite; the floral few, tipped with a nearly sessile gland, and towards the summit furnished, as are the scales of the involucre and the mucronate-acute united chaff of the receptacle, with smaller scattered stipitate glands; achenia sparsely villous; pappus of 5 rigid lanceolate-subulate and somewhat awned scales, about two-thirds the length of the corolla, and as many intermediate and shorter lanceolate-oblong obtuse scales.

California, *Douglas!*—Plant slender, 6–10 inches high. Leaves linear

filiform, 2 inches or more in length. Corolla of the disk with a glabrous tube; of the ray with a rather short glandular tube; the ligule very broad, convolute, deeply 3-cleft; the lateral lobes roundish-cuneiform; the middle one much smaller.

§ 2. *Stem much branched, diffuse, minutely glandular, as well as the involucre and upper leaves; the cup-shaped glands none: rays 3-parted down to the slender tube; the oblong lobes somewhat equal, spreading: teeth of the disk-corolla (purple in the throat) oblong-linear.*—OSMADENIA, Nutt.

5. *C. tenella:* stem somewhat hairy; the branches slender, divaricate, sparingly leafy, terminated by mostly solitary heads; leaves very narrowly linear, scabrous, setose-hirsute towards the base; the lower cauline crowded; those of the branches small, acerose-subulate; bracts few; scales of the involucre and the chaff of the receptacle ovate-lanceolate, somewhat acuminate, covered with small glands; the latter united; achenia of the ray glabrous, rugose; of the disk slightly hairy; scales of the pappus 8–10; the alternate ones produced into rigid very scabrous awns, rather shorter than the corolla; the intermediate ones much shorter, lanceolate-oblong, lacerate-denticulate.—Osmadenia tenella, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 392.

St. Diego, California, *Nuttall!* May.—Plant 6–12 inches high, erect at the base; the filiform branches widely spreading. Heads 3 lines long; the linear-acerose bracts, and the somewhat glutinous involucre and chaff furnished with small and flat slightly pedicellate glands. Chaff united nearly to the summit. Rays white, exserted; the middle division smallest; the fertile achenia apiculate at each end.—The plant is said to exhale a powerful and very agreeable aroma, whence the name imposed by the discoverer.

139. LAGOPHYLLA. *Nutt. in trans. Amer. phil. soc. l. c. p.* 390.

Heads few-flowered; the ray-flowers about 5, pistillate, ligulate, cuneiform, 3-lobed; those of the disk 5–6, staminate and pistillate, but sterile by the abortion of the style and ovary. Scales of the involucre 5, similar to the leaves, ovate-lanceolate, the margins infolded and enclosing the ray-achenia. Receptacle flat, fimbrillate-hirsute in the centre, chaffy at the margin between the ray and disk-flowers; the chaffy scales 5 or 6 in a single series, distinct. Branches of the style in the disk-flowers subulate-filiform, hirsute. Achenia smooth, destitute of pappus; the fertile narrowly oblong-cuneiform, obcompressed, straight, nearly flat and obscurely angled on the back, carinate-angled anteriorly, and hence somewhat triangular; those of the disk entirely abortive.—A perennial? exceedingly branched slender herb, with a smooth and glabrous stem and branches, which are very leafy at the extremity, and terminated by small sessile heads. Leaves alternate, almost imbricated on the branchlets, deciduous, linear-oblong (those of the branches 3–4 lines long), thickish, entire, obtuse, with involute margins, very villous, (as well as the involucre and the summit of the chaff,) especially along the margins, with long and soft white hairs. Rays short and broad, pale yellow.

L. ramosissima (Nutt.! l. c.)

Plains near Wallawallah, Oregon, *Nuttall!*—A remarkable plant, 2–3 feet high. We have not seen the cauline leaves, which are apparently caducous; those of the branches are clothed with long and very soft hairs, thickly spreading from the margin, so as almost to resemble the foot of a hare; whence the name.

140. ANISOCARPUS. *Nutt. in trans. Amer. phil. soc. l. c. p.* 388.

Heads many-flowered; the ray-flowers about 12, ligulate, pistillate, in a single series; those of the disk tubular, staminate and pistillate, but sterile by the abortion of the ovary. Scales of the subglobose involucre as many as the rays, carinate-complicate, and wholly enclosing their achenia. Receptacle somewhat convex, naked and smooth, except the margin, which is furnished with a single series of more or less united chaffy scales between the ray and disk-flowers. Tube of the corolla pubescent. Rays exserted, cuneiform, 3-cleft at the apex. Branches of the style in the disk-flowers subulate, very acute, minutely hispid. Achenia of the ray oblong, obcompressed, flat, somewhat incurved, glabrous, without lateral angles or nerves, crowned with a small sessile disk, destitute of pappus; of the disk abortive, with a pappus of 5–8 small fimbriate-lacerate membranaceous scales.—A villous-hirsute perennial herb, with the aspect of Madia, or Madaria; the leaves linear, elongated, entire or denticulate, sessile, alternate, or the lower opposite. Heads paniculate-corymbose or racemose; the involucre, naked peduncles, and upper part of the stem very glandular. Flowers bright yellow.

A genus intermediate between Madaria (with which it accords in aspect, and from which it chiefly differs in the pappus of the disk-flowers), and Hartmannia, *DC.* (§ of Hemizonia), from which it is distinguished by the flat compressed achenia, entirely enclosed in the involucral scales.

A. madioides (Nutt.! l. c.)

Banks of the Oregon, among rocks, in shady forests, at the outlet of the Wahlamet; rather rare, *Nuttall!*—Stem simple, 1–2 feet high, hirsute with long and short hairs. Radical leaves linear-oblong, remotely serrulate, 3–4 inches in length; the cauline gradually reduced in size. Involucre 3–4 lines in diameter: rays conspicuous, but rather short.—We have not seen the mature fruit.

141. MADARIA. *DC. mem. soc. Genev.* 7. *p.* 280; *Endl. iconogr. t.* 36.

Heads many-flowered; the ray-flowers 10–15, ligulate, pistillate, in a single series; those of the disk tubular, staminate and pistillate, but sterile by the abortion of the ovary. Scales of the subglobose involucre as many as the rays, complicate and enclosing their achenia. Receptacle somewhat convex, fimbrillate-hirsute, except the margin, which is furnished with 1 or 2 series of chaffy scales between the ray and disk-flowers. Corolla pubescent or hairy at the base; the rays twice the length of the involucre. Achenia of the ray as in Madia; those of the disk abortive; all destitute of pappus.—Annual (Californian) hairy and glandular herbs, with the aspect of Madia; the heads

more showy and corymbose. Leaves lanceolate or linear. Flowers yellow; the rays often spotted with purple at the base: anthers brown.

1. *M. elegans* (DC.): stem and leaves hispid with glandless and glanduliferous hairs intermixed. *DC.! not.* 7. *pl. rar. Genev. p.* 17, & *prodr.* 5. *p.* 692; *Hook. & Arn.! bot. Beechey, suppl. p.* 355; *Hook. bot. mag. t.* 3548. Madia elegans, *Don, in bot. reg. t.* 1458. M. viscosa, *β. Hook. fl. Bor.-Am.* 2. *p.* 24.

California! and Oregon! Common in cultivation.—Rays linear-cuneate, spotted with purple at the base, acutely 3-cleft at the apex.

2. *M. corymbosa* (DC.): stem and involucre hispid with glandless and glanduliferous hairs intermixed; leaves linear, villous, somewhat hispid, glandless. (Varies with the glands many, or very few.) *DC.! l. c.; Hook. & Arn. l. c.; Endl. iconogr. t.* 36. M. racemosa, *Nutt.! in trans. Amer. phil. soc. l. c.*

β. ? hispida (DC. l. c.): stem, leaves, and involucre hispid with spreading hairs, all of them glandless.

California and Oregon!—Rays sometimes with a brown spot at the base, 3-cleft at the apex.

142. MADIA. *Molina, Chil.; Cav. ic.* 3. *p.* 50, *t.* 298; *DC. l. c.*

Madia & Madorella, *Nutt.*

Heads usually many-flowered; the ray-flowers 5–12, ligulate, pistillate, in a single series; those of the disk tubular, perfect. Scales of the subglobose involucre in a single series, as many as the rays, carinate-complicate and enclosing their achenia. Receptacle flat, naked, except the margin, which is furnished with 1–2 series of chaffy scales, usually more or less united. Corolla with a pubescent tube; the rays slightly exserted. Branches of the style in the disk-flowers lanceolate, acute or acuminate, the margins minutely hispid. Achenia of the ray and disk similar, compressed, nearly straight, oblong-obovate, glabrous (minutely and closely striate), destitute of pappus, usually more or less one-nerved or angled on each side.—Annual or biennial hairy and glandular herbs (natives of Chili, California, & Oregon); with oblong or linear sessile or partly clasping entire or denticulate leaves; the lowest often opposite, the others alternate. Heads bracteate, sessile, or on short peduncles, somewhat racemose. Flowers pale yellow: anthers brown.

1. *M. sativa* (Molina): villous and glandular throughout; leaves lanceolate or oblong-lanceolate; heads many-flowered, mostly racemose and peduncuIate; achenia manifestly 1–2-angled on each side.—*DC. not.* 7. *pl. rar. Genev.*, & *mem. soc. Genev.* 7. *p.* 277, & *prodr.* 5. *p.* 691; *Hook. & Arn. bot. Beechey, suppl. p.* 355; *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 387. M. viscosa, *Cav. l. c.; Hook.! fl. Bor.-Am.* 2. *p.* 24, in part. M. mellosa, *Jacq. hort. Schœnb.* 3. *t.* 302. Sclerocarpus gracilis, *Smith, in Rees, cycl.*, ex *Hook. & Arn. l. c.*

β. congesta: heads clustered at the summit of the stem and branches.—M. congesta, *Nutt.! l. c.*

Oregon! and California! doubtless indigenous. Also a native of Chili, where it is cultivated for the oil yielded by its seeds.

2. *M. racemosa:* hirsute, the stem and linear mostly acute leaves scarcely glandular; heads racemose, many-flowered; involucre glandular; ray-achenia flat, not at all (or obscurely) angled on the sides.—Madorella racemosa, *Nutt.! in trans. Amer. phil. soc. l. c.*

Oregon, near the Wahlamet, *Nuttall!* Fort Vancouver, *Mr. Tolmie!*—A more slender plant than the preceding, 12 to 20 inches high; the stem sparingly glandular at the summit; the leaves clothed with short somewhat appressed hairs, sometimes glandular-denticulate. Rays 8–12, rather conspicuous; the disk-flowers several. The ray-achenia are flat and even on the sides; but those of the disk are more or less 1-nerved or angled: and the preceding species presents such diversities that we are not very sure that this is entirely distinct from it. The style accords with M. sativa.

3. *M. dissitiflora:* stem, as well as the lanceolate-linear leaves, hirsute-pubescent; the branches glandular; heads scattered, few-flowered; scales of the involucre 5–8, very glandular; achenia all flat, and scarcely or not at all angled on the sides.—Madorella dissitiflora, *Nutt.! l. c.*

Blue Mountains and plains of Oregon, *Nuttall!*—A slender twiggy plant, 6 to 15 inches high; the heads scarcely 3 lines in diameter, with inconspicuous rays. Disk-flowers 3–6. Style as in M. sativa.

143. AMIDA. *Nutt. in trans. Amer. phil. soc. (n. ser.) 7. p. 390.*

Heads few-(2–6-) flowered; the flowers either all tubular and perfect (the corolla with a cylindrical pubescent tube, and a very short scarcely dilated 5-toothed limb), or one or two of them pistillate and radiate, with a very small cuneiform and 3-lobed ligule. Involucre oblong, subtended by 2–3 linear bracts; the scales as many as the flowers, carinate-cymbiform, nearly straight, each nearly enclosing an achenium, all more or less united with each other by their inner margins. Receptacle small, somewhat punctate. Branches of the style in the perfect flowers oblong, obtuse, slightly hairy. Achenia linear-oblong, straight or slightly incurved, compressed-3–4-angled, glabrous (minutely striate), destitute of pappus, terminated by a sessile areola.—Annual slender hirsute and glandular herbs (indigenous to the plains of the interior of Oregon and of the Saskatchawan), with the aspect of Madia; the leaves linear, sessile, entire; the small heads irregularly clustered (2–5 together) in the axils and on the somewhat corymbose branches. Flowers pale yellow, scarcely exserted beyond the involucre.

These plants are, as it were, singularly reduced Madiæ; in which, as the flowers form but a single verticil, the involucral scales supply the place of the chaff of the receptacle. In both species the flowers vary from 2 (both perfect), when the involucre is compressed, to 3, 5, or rarely 6, when the involucre presents as many carinate lobes and strong re-entering angles. This genus presents the only instance in which a plant of the division Madieæ has been found east of the Rocky Mountains, or of the Andes. Mr. Nuttall doubtless was not aware that his A. hirsuta is the Madia glomerata, *Hook.*; or he would have adopted that name for the species.

1. *A. gracilis* (Nutt.! l. c.): scabrous-hirsute with appressed hairs; leaves narrowly linear, ciliate with a few spreading bristles near the base.

Rocky Mountain plains and prairies of the Oregon, *Nuttall!*—Stem about a foot high, slender, rigid, mostly simple; with the clusters of heads often axillary, and smaller than in the following.

2. *A. hirsuta* (Nutt.! l. c.): hirsute with long spreading hairs and short stipitate glands; stem often corymbose at the summit.—Madia glomerata, *Hook.! fl. Bor.-Am.* 2. *p.* 24.

Plains of the Saskatchawan, *Drummond!* Plains of the Rocky Mountains and of the Oregon, with the preceding species, *Nuttall!*—A stouter plant than A. gracilis, with broader and more carinate involucral scales.

144. HARPÆCARPUS. *Nutt. in trans. Amer. phil. soc. l. c. p.* 389.

Heads few-flowered; the ray-flowers 5–8, pistillate, in a single series, each enclosed in one of the carinate-complicate and lunate scales of the involucre; the disk-flower solitary! tubular and perfect, fertile, surrounded by a 5-angled and 5-toothed cup, consisting of the united chaff of the receptacle. Corolla glabrous; of the disk-flower infundibuliform, 5-toothed; of the rays scarcely exceeding the involucre, tubular below, cleft above anteriorly; the very short and broad ligule 2–3-toothed or lobed, about the length of the linear glabrous branches of the style. Branches of the style in the disk-flower short, lanceolate-oblong, with barbellate-hispid margins. Achenia glabrous, much compressed, destitute of pappus; of the rays gibbous, obovate-lunate, the incurved summit produced into a short ascending beak, when mature deciduous with the scales of the involucre that enclose them; that of the disk semi-obovate, straight, with a truncate terminal areola, included by the united chaff.—A small slender hirsute annual (3–12 inches high), with somewhat the aspect of a Myosotis; the erect simple stem clothed with mostly alternate narrowly linear and entire leaves, corymbose-paniculate at the summit, bearing several small heads on simple and naked peduncles, which are elongated in fruit. Flowers pale yellow, very small.

H. madarioides (Nutt.! l. c.)—Sclerocarpus exiguus, *Smith, in Rees, cycl.* (ex char. & descr. *Hook. & Arn. bot. Beechey, suppl. p.* 355, under Madaria corymbosa.)

Oregon ('North West Coast,' doubtless collected by the venerable Menzies, if we are right as to the synonymy): common on rocky plains in depressions at the outlet of the Wahlamet, *Nuttall!* May.—Leaves about an inch long, less than a line wide. Peduncles filiform and often 2 inches long in fruit, bearing a depressed-globose head scarcely 2 lines in diameter. Involucre covered with stipitate glands and short hispid hairs intermixed. Plant somewhat aromatic.

Subtribe 6. ANTHEMIDEÆ, *Cass., DC.*—Heads mostly heterogamous (never diœcious); the ray-flowers in one or more series, pistillate or rarely neutral, either ligulate or tubular; the disk-flowers perfect or sometimes staminate and infertile. Receptacle naked or chaffy. Anthers not caudate. Branches of the style truncate and mostly bearded at the apex, very rarely produced into a short cone. Pappus small and coroniform, or usually none.—Leaves mostly alternate.

CONSPECTUS OF THE GENERA.

Div. 1. EUANTHEMIDEÆ.—Receptacle chaffy. Rays ligulate, in a single series (or rarely wanting): the disk-flowers perfect. 407

145. MARUTA. Rays neutral. Achenia obovoid, ribbed.
146. ANTHEMIS. Rays pistillate. Achenia terete or quadrangular.
147. ACHILLEA. Rays pistillate. Achenia obcompressed, margined.

Div. 2. CHRYSANTHEMEÆ.—Receptacle naked. Rays ligulate in a single series (rarely none): the disk-flowers perfect. 409

148. MONOLOPIA. Scales of the cup-shaped involucre 8–10, united below. Receptacle convex. Achenia of the ray somewhat obcompressed; of the disk compressed. Leaves opposite and alternate.
149. COINOGYNE. Scales of the involucre few, imbricated, unequal. Receptacle conical. Achenia consimilar, oblong. Leaves opposite.
150. VENEGASIA. Scales of the campanulate involucre imbricated in several series; the 5 exterior foliaceous. Receptacle flat. Achenia obscurely quadrangular. Leaves alternate.
151. EGLETES. Scales of the hemispherical involucre imbricated. Receptacle convex. Achenia angled or ribbed, with a thick coroniform pappus.
152. LEUCANTHEMUM. Scales of the depressed involucre imbricated. Receptacle flat or convex. Achenia somewhat terete, striate, destitute of pappus, or those of the ray with an auriculæform pappus.
153. MATRICARIA. Scales of the involucre imbricated. Receptacle ovate-conical. Achenia angled, wingless: pappus none, obscure, or coroniform.

Div. 3. COTULEÆ & ARTEMISIEÆ.—Receptacle naked. Heads discoid, homogamous or heterogamous: the flowers all tubular; those of the disk perfect, but sometimes infertile. 413

154. AROMIA. Heads heterogamous. Achenia quadrangular, tapering to the base. Pappus of chaffy scales nearly as long as the corolla.
155. TANACETUM. Heads homogamous or heterogamous. Achenia angled or ribbed, with a large epigynous disk. Pappus none, or minute. 414
156. ARTEMISIA. Heads heterogamous or homogamous. Achenia obovoid, with a small epigynous disk. Pappus none. 415

Div. 4. HIPPIEÆ.—Receptacle naked. Heads monœcious: the pistillate flowers in the margin; the staminate in the centre. 425

157. SOLIVA. Fertile flowers in several series, apetalous or nearly so; the staminate few. Achenia obcompressed, with winged or callous margins, armed with the persistent style. 425

Div. 1. EUANTHEMIDEÆ, *DC.*—Receptacle chaffy. Heads mostly radiate; the rays ligulate, in a single series; the disk-flowers perfect.

145. MARUTA. *Cass., Less.; DC. prodr.* 6. *p.* 13.

Heads many-flowered; the rays neutral (rarely nearly wanting), continuous with the sterile ovary. Scales of the hemispherical involucre imbricated

in few series, shorter than the disk. Receptacle conical, chaffy throughout or only at the summit. Achenia obovoid or obpyramidal, ribbed, glabrous, destitute of pappus.—Annual (European) fetid herbs; with tripinnately divided leaves, and solitary heads terminating the branches. Rays white, often deflexed; the disk yellow.

1. *M. Cotula* (DC.! l. c.): scales of the involucre with whitish scarious margins; receptacle conical, chaffy at the summit; the chaff subulate.—Anthemis Cotula, *Linn. spec.* 2. *p.* 894; *Engl. bot. t.* 1772; *Nutt. gen.* 2. *p.* 171; *Bart. veg. mat. med. t.* 14; *Hook. fl. Bor.-Am.* 2. *p.* 318; *Darlingt. Cest. p.* 489.

β. rays few and small, or occasionally none.

Roadsides, &c., throughout the United States, where it is completely naturalized. *β.* St. Louis, Missouri, *Dr. Engelmann!* June–Nov.—Plant hairy or nearly glabrous, with a strong unpleasant smell, and acrid properties. Achenia more or less tuberculate in lines.—*May-weed.*

146. ANTHEMIS. *Linn.* (excl. spec.); *DC. fl. Fr. & prodr.* 6. *p.* 4.

Heads many-flowered; the rays pistillate. Scales of the involucre imbricated in few series. Receptacle convex or conical, with membranaceous chaff among the flowers. Achenia terete or very obtusely quadrangular, striate or smooth, destitute of pappus, or with a minute crown.—European or Oriental odorous herbs, with 1–2-pinnately parted leaves; the branches terminated by single bractless heads. Rays usually white; the disk yellow.

1. *A. arvensis* (Linn.): diffuse or erect, pubescent; leaves pinnately parted, the lobes linear-lanceolate, approximate, and with the teeth very acute; the branches leafless at the summit, bearing solitary heads; scales of the involucre with white scarious margins, obtuse; chaff of the conical receptacle lanceolate, acuminate; achenia crowned with a very short somewhat toothed margin. *DC. l. c.*—*Engl. bot. t.* 602; *Fl. Dan. t.* 1179; *Darlingt. fl. Cest. p.* 488.

Sparingly naturalized in the Northern States. June–Aug.—① The *Wild Chammomile* of Europe resembles Maruta Cotula, but is not fetid, with larger heads, fertile rays, &c.

A. nobilis, the officinal *Chammomile*, is said by Nuttall to be naturalized near Lewiston, Delaware.

147. ACHILLEA. *Linn.*; *Schkuhr, handb. t.* 255; *Less. syn. p.* 250.

Heads many-flowered; the rays few, or 10–20, pistillate, short. Scales of the involucre imbricated. Receptacle flat, or sometimes elongated, chaffy. Achenia oblong, obcompressed, margined, destitute of pappus.—Perennial herbs; with alternate mostly pinnatifid or pinnately divided leaves, and small corymbose heads.—*Yarrow.*

§ 1. *Involucre campanulate: rays* (*white*) 5–20, *flat, longer than the involucre* (*in* A. multiflora *very short*): *receptacle broad, nearly flat: achenia often with wing-like margins.*—PTARMICA, Tourn., DC.

1. *A. Ptarmica* (Linn.): leaves glabrous, lanceolate-linear, sharply and equally serrate with appressed teeth; heads loosely corymbose; rays 8–12, much longer than the disk.—*Linn. spec.* 2. *p.* 898; *Fl. Dan. t.* 643; *Engl. bot. t.* 757; *Pursh, fl.* 2. *p.* 552. Ptarmica vulgaris, *DC. prodr.* 6. *p.* 23.

Canada to New York, according to Pursh: but it has not since been met with. Introduced in Danvers, Massachusetts, *Dr. Nicholls!* (*Mr. Oakes.*) Aug.–Sept.—Disk and ray white.—*Sneeze-wort.*

2. *A. multiflora* (Hook.): clothed with villous hairs when young; leaves elongated, linear-lanceolate, closely and sharply pinnatifid-serrate; the teeth or segments lanceolate, mucronate, serrulate, somewhat appressed; heads in dense compound corymbs; rays 10–12, very short.—*Hook.! fl. Bor.-Am.* 1. *p.* 318. A. Ptarmica, *Richards.! appx. Frankl. journ. ed.* 2. *p.* 33.

Woody country of Subarctic America, as far north as Fort Franklin, *Richardson! Drummond!*—Leaves evenly and deeply pectinate-incised. Ligules roundish, scarcely exceeding the disk; in which respect it differs from all other species of this section.

3. *A. borealis* (Bongard): stem striate, villous with soft hairs; leaves sessile, pinnately divided; the segments bipinnatifid; the lobes linear, acute, pubescent; heads corymbose; the peduncles villous-pubescent, branched; exterior scales of the involucre rather obtuse, the inner oblong; rays obovate, entire, 4-nerved. *DC.—Bongard, veg. Sitcha, in mem. acad. St. Petersb. l. c. p.* 149. Ptarmica borealis, *DC. prodr.* 6. *p.* 21.

Sitcha, *Kastalsky*, ex *Bongard.*—The heads are compared with those of A. atrata. Flowers white.

§ 2. *Involucre ovoid-oblong; rays few and short; receptacle small: achenia slightly margined.*—MILLEFOLIUM, Tourn. (Achillea, *DC*)

4. *A. Millefolium* (Linn.): cauline leaves nearly sessile, bipinnately parted; the lobes linear, 3–5-cleft, mucronate; the rachis entire or slightly toothed near the apex of the leaf; corymb compound, fastigiate; rays 4–5, obovate, white, or sometimes rose-color (var. *rosea*).—*Linn. spec. p.* 899; *Fl. Dan. t.* 737; *Engl. bot. t.* 758; *Hook.! fl. Bor.-Am.* 1. *p.* 318; *Darlingt.! fl. Cest. p.* 489; *DC. prodr.* 6. *p.* 24. A. gracile & A. occidentale, *Raf.! in herb. DC.*—Varies from almost glabrous, with the divisions of the leaves slender and loose, to densely woolly, with smaller and narrower leaves, and the divisions and lobes short and very much crowded; which is A. Millefolium γ. lanata, *Koch:* A. tomentosa, *Pursh! fl.* 2. *p.* 319 (Interior of Oregon, *Lewis!*): A. lanulosa, *Nutt.! in jour. acad. Philad.* 7. *p.* 20: & A. setacea, *Schweinitz! in Long's 2nd exped.* 2. *p.* 119.

Throughout North America, from the Arctic regions! along the Rocky Mountains! to Mexico, and from Newfoundland! to Oregon! Sitcha, and California. Also, doubtless introduced from Europe into pastures, &c. Aug.–Oct.—The flowers of A. tomentosa, *Pursh*, although yellowish in the dried specimen, were probably white in the living plant.—Bitter, astringent, and aromatic.—*Yarrow.*

A. asplenifolia (Vent. hort. Cels.) with rose-colored rays, is of unknown origin. It is said to have been raised from seeds brought from Carolina by Bosc; but, according to De Candolle, it had been cultivated in the gardens of Europe long before the time of Bosc.

Div. 2. CHRYSANTHEMEÆ, *DC.*—Receptacle naked. Heads radiate; the rays ligulate, pistillate, rarely neutral, in a single series (rarely wanting); the disk flowers perfect.

148. MONOLOPIA. *DC. prodr.* 6. *p.* 74 ; *Hook. ic. pl. t.* 343 & 344.

Heads many-flowered; the rays 8–10, pistillate; the disk-flowers perfect, but apparently sterile. Scales of the cup-shaped involucre 8–10, united below. Receptacle convex or somewhat conical, naked. Disk-corolla with a slender terete tube, and a dilated limb; the short teeth bearded. Achenia glabrous, destitute of pappus; those of the ray obovoid, slightly obcompressed; of the disk compressed, infertile?—Annual (Californian) woolly herbs; with linear-oblong sessile leaves (either opposite or alternate), and solitary heads terminating the branches. Disk and rays yellow.

1. *M. major* (DC.! l. c.): lower leaves somewhat toothed, the upper entire; scales of the involucre strictly in a single series, united almost to the summit; rays much longer than the disk; the tube furnished with a small toothed appendage opposite the ligule; receptacle nearly conical.—*Hook.! ic. pl. t.* 344, & *bot. Beechey, suppl. p.* 359, & *bot. mag. t.* 3839. Hologymne Douglasii, *Fisch., Mey. & Lall. ind.* 8. *hort. St. Petersb.* (1841) *p.* 64.

California, *Douglas!*—A foot high. Heads showy.

2. *M. minor* (DC.! l. c.): leaves sparingly lobed; the lobes linear; scales of the involucre somewhat in 2 series, united only at the base; rays short; receptacle convex.—*Hook.! ic. pl. t.* 343, & *bot. Beechey, l. c.*

California, *Douglas!*—Plant 4 or 5 inches high. Tube of the disk-corolla hirsute.

149. COINOGYNE. *Less. in Linnæa*, 6. *p.* 521, *t.* 6; *DC. prodr.* 6. *p.* 42.

Heads many-flowered; the rays several, small, pistillate; the disk-flowers tubular, glabrous, 5-toothed. Scales of the involucre few, imbricated, unequal, somewhat fleshy, very obtuse; the outermost short and rounded. Receptacle conical, naked. Branches of the style in the disk-flowers tipped with a short cone, nearly as in Tagetes. Achenia of the ray and disk similar, oblong, glabrous, many-ribbed, destitute of pappus.—A low perennial herb; with ascending stems, terminated by solitary rather large heads, and fleshy ligulate and entire opposite leaves; their tapering bases connate in a short sheath. Flowers yellow?

C. carnosa (Less.! l. c.).—*Hook. & Arn. bot. Beechey, p.* 150.

California, *Chamisso! Capt. Beechey.*—Stems about 4 inches in length. Leaves half an inch to an inch long, 1–2 lines wide.

150. VENEGASIA. *DC. prodr.* 6. *p.* 43.

Heads many-flowered; the rays numerous (15), pistillate. Scales of the campanulate involucre imbricated in several series; the 5 exterior cordate, acutish, foliaceous; the intermediate 10 ovate-orbicular, very obtuse, somewhat colored; the innermost (about 15) small and chaffy, lanceolate or oblong. Receptacle flat, naked. Tube of the corolla glandular, larger than the ovary. Branches of the style terminated by an obscure cone. Achenia

oblong, obscurely quadrangular (muricate, *DC.*), destitute of pappus.—A somewhat shrubby and nearly glabrous branching plant; with alternate deltoid-cordate toothed leaves, on slender petioles, and large nodding heads on short peduncles. Ray and disk yellow.

V. carpesioides (DC.! l. c.)—*Nutt.! in trans. Amer. phil. soc. l. c. p.* 395. California, *Douglas! Nuttall!* (In rocky situations around St. Barbara, near the sea.)—Leaves like those of Campanula rhomboidalis. Head, with the conspicuous rays, 2 inches in diameter.

151. EGLETES. *Cass. dict.; Less. syn. p.* 252; *Nutt. l. c.*

Egletes & Leucopsidium, *DC.*

Heads many-flowered; the rays numerous, pistillate. Scales of the hemispherical involucre ovate-lanceolate, with scarious margins, imbricated in few series. Receptacle convex, naked. Branches of the style in the disk-flowers terminated by a short cone. Achenia glabrous, or somewhat hairy when young, somewhat angled or ribbed, scarcely compressed, with a short and thickened coroniform pappus, which is more or less toothed or cleft.—Diffuse or erect canescent or hairy branching (West Indian, Mexican, and Arkansan) herbs; with alternate often toothed or pinnatifid leaves. Heads terminating the branches. Rays white; the disk yellow.

1. *E. Arkansana* (Nutt.): annual, canescent, erect; cauline leaves, sessile, lanceolate-oblong, obtuse, entire, or sparingly and slightly toothed; the radical tapering to the base, sinuate-toothed; rays much longer than the involucre; corolla of the disk becoming thickened and corky at the base; achenia sulcate-striate; pappus laciniate-cleft.—*Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 394. Leucopsidium Arkansanum, *DC.! prodr.* 6. *p.* 43. Keerlia skirrobasis, *Hook.! ic. pl. t.* 240, not of *DC.*

Arkansas! and Texas! Aug.—Head smaller than in Leucanthemum vulgare: the rays linear, nearly an inch long. Pappus thickened and almost corneous at the base, usually deeply cleft into sharper segments than is represented in Hooker's figure above-cited: that of E. (Leucopsidium, *Benth.*) humilis is minutely and evenly toothed or cleft, more like that of E. Domingensis.

152. LEUCANTHEMUM. *Tourn.; DC. prodr.* 6. *p.* 45.

Heads many-flowered; the rays pistillate, numerous. Scales of the broad imbricated involucre with scarious margins. Receptacle flat or convex, naked. Corolla of the disk with a fleshy obcompressed and slightly 2-winged tube. Achenia of the disk and ray similar, somewhat terete, striate, destitute of pappus, or those of the ray sometimes furnished with an auriculæform pappus.—Perennial herbs, with alternate mostly toothed or pinnatifid leaves, and large solitary heads terminating the stem or branches. Rays white or occasionally reddish; the disk yellow.

§ *Achenia of the ray as well as the disk destitute of pappus: flowers all fertile.*—PHALACROGLOSSUM, DC. (Chrysanthemum, *Less.*)

1. *L. integrifolium* (DC. l.c.): dwarf, hairy; leaves spatulate-linear, entire, chiefly crowded at the base of the simple scape-like stem; scales of the involucre obovate-elliptical, with broad and brown lacerate scarious margins.—Chrysanthemum integrifolium, *Richards.! appx. Frankl. journ. ed. 2. p.* 33; *Hook.! in Parry's 2nd voy. p.* 398, *& fl. Bor.-Am.* 1. *p.* 319.

Shores of Arctic America, and on the Copper Mountains in lat. 57°. *Richardson!*—Rays elliptical, white.

2. *L. arcticum* (DC.! l.c.): nearly glabrous; stem low, simple, naked near the summit; lower leaves cuneiform, tapering into a petiole, incised or coarsely toothed at the apex; the uppermost small, mostly linear and entire; scales of the involucre oval, with blackish scarious margins.—Chrysanthemum arcticum, *Linn. spec.* 2. *p.* 889; *Pursh, fl.* 2. *p.* 526; *Hook.! fl. Bor.-Am.* 1. *p.* 319.

Arctic America! extending south to York Factory, Hudson's Bay! and to Fort Vancouver! probably confined to the coast.—Stem 5–10 inches high. Head as large as in L. vulgare.

3. *L. vulgare* (Lam.): stem erect, somewhat branched; leaves laciniate-incised or pinnatifid-toothed; the cauline partly clasping; the radical obovate-spatulate, petioled; scales of the involucre with narrow rusty-brown scarious margins.—*DC.! prodr.* 6. *p.* 46. Chrysanthemum Leucanthemum, *Linn.! l.c.; Fl. Dan. t.* 994; *Engl. bot. t.* 601; *Pursh, l.c.; Darlingt.! fl. Cest. p.* 490.

β. involucral scales bordered with white scarious margins.

Naturalized in fields and meadows throughout the United States; also in Canada and Oregon: a very troublesome weed. β. Alexandria, Louisiana, *Dr. Hale!* June–July.—Leaves variable. Achenia ribbed.—*White Daisy. Ox-eye Daisy.*

153. MATRICARIA. *Linn.; Tourn.; DC. prodr.* 6. *p.* 50.

Heads many-flowered; the rays pistillate, rarely very small or wanting. Scales of the involucre nearly equal, imbricated in few series. Receptacle ample, ovate-conical! naked. Corolla of the disk 4–5-toothed; the tube more or less obcompressed, or nearly terete. Achenia angled, wingless, those of the disk and ray similar. Pappus none, or obscure, or occasionally coroniform.—Smooth and branching annuals; the pinnately parted leaves with linear or setaceous segments. Heads solitary or somewhat corymbose. Rays white; the disk yellow.

§ 1. *Heads radiate: achenia with a coroniform pappus: corolla of the disk 5-toothed.*—CHAMOMILLA, DC.

1. *M. inodora* (Linn.): glabrous; stem branched, diffuse or erect; leaves bipinnately divided; the lobes linear, acute, flattish, 2–3 parted; heads solitary on the branches; scales of the involucre oblong, with whitish [or brown] scarious margins; achenia 3–4-angled; pappus coroniform, entire. *DC.—Linn. fl. Suec. ed.* 2. *p.* 297; *DC. prodr.* 6. *p.* 52. Chrysanthemum inodorum, *Linn. spec.; Fl. Dan. t.* 696; *Schkuhr, handb. t.* 253. Pyrethrum inodorum, *Smith, fl. Brit.* 2. *p.* 900; *Engl. bot. t.* 676; *Hook.! fl. Bor.-Am.* 1. *p.* 320.

β.? *nana:* stem simple, with a solitary head.—Pyrethrum inodorum β. nanum, *Hook.! l.c., & bot. Beechey, p.* 126. P. Caucasicum, *Willd. ex Less.* Chrysanthemum grandiflorum, *Hook.! in Parry's 2nd voy. p.* 398.

"Lake Huron, *Dr. Todd.*" York Factory, *Drummond*; and as far north as Bear Lake, *Richardson!* β. Shores and islands of the Arctic sea, *Richardson! Chamisso.*" *Hook.*—We are not well satisfied that the American plant is the same as the European M. inodora, or that it is an annual.

§ 2. *Heads discoid, rayless: pappus none, or an obscure entire margin: corolla of the disk* 4*-toothed, obcompressed, and more or less* 2*-winged.* —ANACTIDEA, DC. (Lepidotheca, *Nutt.*)

2. *M. discoidea* (DC.! l. c.): branched from the base, glabrous, leafy; leaves 2–3-pinnately parted; the lobes short, linear, acute; heads (small) on short peduncles; scales of the involucre oval, with broad white scarious margins; rays none; pappus an obsolete coroniform margin; receptacle acutely conical.—M. tanacetoides, *Fisch. & Meyer, 7th ind. sem. St. Petersb.* Santolina suaveolens, *Pursh! fl.* 2. *p.* 520; *DC. prodr.* 6. *p.* 37. Artemisia matricarioides, *Less. in Linnæa*, 6. *p.* 210. Tanacetum matricarioides, *Less. syn. p.* 265. T.? suaveolens, *Hook.! fl. Bor.-Am.* 1. *p.* 327, *t.* 110. T. pauciflorum, *DC. prodr.* 6. *p.* 131; not of *Richards.* Cotula matricarioides, *Bongard, veg. Sitcha, in mem. acad. St. Petersb. l. c. p.* 150. Lepidotheca suaveolens, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 397.

Western America from California! to Unalaschka! Sitcha! and the adjacent parts of Asia. Also in barren places around St. Louis, Missouri, *Dr. Engelmann!* perhaps introduced, as Nuttall states it was raised in a garden at Philadelphia from seeds brought by Capt. Lewis. May–July.—An inconspicuous weed-like plant; "with nearly the receptacle, involucre, and achenia of M. suaveolens." The achenia of this species, and of M. Chamomilla, although appearing perfectly smooth under an ordinary lens, when moistened emit from their whole surface innumerable filaments of extreme tenuity, forming a kind of gelatinous mass, much as in Blennosperma, p. 272.

M. Chamomilla (Linn.), which abounds in waste grounds in Europe, and possessing to some extent the bitter and aromatic properties of the officinal Chammomile, is sometimes substituted for it, under the name of *Wild Chammomile*, has been collected in Texas ("Bottom land on the Brazos") by Dr. Lindheimer: doubtless introduced, and perhaps very locally naturalized.

Pyrethrum Parthenium (the *Feverfew*) has escaped from gardens, and is beginning to be naturalized in some places.

P. serotinum, Linn., which has been in cultivation for a long period, is doubtless not of North American origin.

Chrysanthemum? nanum (Hook.): stem somewhat branched, clothed with loose deciduous wool; leaves pinnatifid; the segments linear and entire; heads terminal, solitary; achenia obovate-oblong, minutely papillose (receptacle naked, convex; rays 8–10, entire, apparently white; scales of the involucre elliptical.) *Hook. fl. Bor.-Am.* 1. *p.* 320.

North West Coast of America, *Menzies.*—A plant of doubtful genus, 3–5 inches high; the head about the size of a Daisy. *Hook.*

Div. 3. COTULEÆ & ARTEMISIEÆ, *DC.*—Receptacle naked (not chaffy.) Heads discoid, homogamous or heterogamous; the flowers all tubular; those of the disk perfect, but sometimes infertile.

154. AROMIA. *Nutt. in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 395.

Heads discoid, heterogamous; the flowers all tubular; the 4 or 5 marginal pistillate, with the corolla obliquely truncate and 2–3-toothed; the others

(10–12) perfect, with the corolla 5-toothed, nearly destitute of proper tube. Scales of the involucre 5 or 6, equal, concave-carinate, obovate, nearly in a single series, membranaceous. Receptacle convex, naked. Branches of the style truncate. Achenia of the ray and disk similar, quadrangular, tapering to the base, hairy on the angles. Pappus of about 12 oblong obtuse nerveless chaffy scales, distinct or slightly united at the base, much shorter than the achenia, but almost equalling the very short corolla.—An aromatic annual or biennial branching herb, nearly glabrous; the branchlets glutinous. Leaves linear; the upper alternate, entire; the lower (often opposite) trifid or somewhat pinnatifid; the lobes filiform-linear. Heads corymbose, small. Flowers yellow.

A. tenuifolia (Nutt.! l. c.)

St. Diego, California, near the coast, *Nuttall!* May.—Lower leaves 2–3 inches long. Heads turbinate, 2–3 lines in diameter: the corolla of the pistillate flowers not longer than the perfect, both very short. Achenia and pappus much as in Bahia and Chænactis.—Although placed by Nuttall in Anthemideæ, Div. Cotuleæ, this plant should rather find a place in the Subtribe Heleniceæ.

155. TANACETUM. *Linn.; Gærtn. fr. t.* 165; *DC. prodr.* 6. *p.* 127.

Heads discoid, homogamous, with the flowers all tubular and perfect, or heterogamous; the marginal flowers pistillate, in a single series, 3–4-toothed. Scales of the involucre imbricated, dry. Receptacle convex, naked. Achenia angled or ribbed, glabrous, with a large epigynous disk. Pappus either none or minute, membranaceous, coroniform, entire or toothed, often unequal. Herbs or suffruticose plants; with alternate variously dissected leaves, and solitary or corymbose (rather large) heads. Flowers yellow.

§ 1. *Heads (campanulate-hemispherical) heterogamous; the terete ray-flowers 3-toothed; the disk-flowers 5-toothed.*—EUTANACETUM, DC.

1. *T. vulgare* (Linn.): stem herbaceous, erect, glabrous; leaves nearly glabrous, bipinnately parted; the rachis and lobes incisely serrate; corymb of numerous heads; inner scales of the involucre scarious at the apex, obtuse; pappus short, equal, 5-lobed. *DC.—Lam. ill. t.* 696, *f.* 1; *Engl. bot. t.* 1229; *Pursh, fl.* 2. *p.* 522; *Hook.! fl. Bor.-Am.* 1. *p.* 327; *Darlingt.! fl. Cest. p.* 492.

β. crispum (DC.): leaves more incised and crisped.

Naturalized abundantly in the Northern States! and Canada! July-Sept. 2f—*Tansey.*

§ 2. *Heads (hemispherical, the disk convex in fruit,) heterogamous; the ray-flowers obcompressed, 3–5-lobed or toothed, slightly winged at the base; the disk-flowers 5-toothed.*—HOMALOTES. (Omalanthus, *Less.*—Omalotes, *DC.*—Homalotes, *Endl.*)

2. *T. Huronense* (Nutt.): hairy or almost tomentose when young; stem stout, herbaceous, striate-angled; leaves bipinnately divided; the lobes oblong, pinnatifid-incised, or often nearly entire, mucronate with a callous point; heads (large) corymbose, or rarely nearly solitary, on stout peduncles;

inner scales of the involucre with brownish scarious margins; ray-flowers variable, often deeply cleft on the inside, with the rounded ligule slightly 3-toothed or 3-lobed, frequently with the limb 3–5-parted; pappus short, toothed.—*Nutt.! gen.* 2. *p.* 141, & *in trans. Amer. phil. soc. l. c. p.* 401. T.? camphoratum, *Less. in Linnæa*, 6 *p.* 521. T. Douglasii, *DC.! prodr.* 6. *p.* 128. T. boreale, *of the English gardens*; *Nutt. in trans. Amer. phil. soc. l. c.* Omalanthus camphoratus, *Less. syn. p.* 260; *Hook.! fl. Bor.-Am.* 1. *p.* 321. Omalotes camphorata, *DC. prodr.* 6. *p.* 83.

Shores of Lakes Huron and Superior! north to York Factory on Hudson's Bay! and west to Oregon! and California!—4 A stout plant, 1–3 feet high; the heads much larger than those of T. vulgare; the disk strongly convex in fruit. Rays slightly exserted.

§ 3. *Heads (obovoid) heterogamous; the ray-flowers (about 5) truncate, 2–3-toothed; the disk-flowers 5-toothed; the central apparently infertile.*—SPHÆROMERIA, Nutt.

3. *T. capitatum:* cæspitose, suffrutescent, silky-canescent; leaves clustered on a branched caudex, cuneiform, 3–5-parted or pedate; those of the somewhat naked scapes nearly linear, entire or toothed at the apex; heads numerous, capitate; scales of the involucre scarious; pappus minute and irregular, denticulate, nearly obsolete in the disk-flowers.—Sphæromeria capitata, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 402.

Rocky Mountains, on a high hill, near the Red Butes of the Platte, towards its northern sources on the Sweet Water, *Nuttall!* June.—Plant growing in dense tufts; the scapes 3 or 4 inches high, terminated by the spherical cluster of heads. Corolla, especially of the exterior flowers, becoming enlarged and indurated at the base.—Odor agreeable, like that of Chammomile.

4. *T. Nuttallii:* somewhat cæspitose, silvery-canescent; leaves cuneiform, obtusely 3-lobed or toothed at the apex; the lower crowded on the branches of the woody caudex; the upper scattered on the flowering stems; heads few (3–5) in a terminal capitate cluster; scales of the involucre scarious; pappus very minute, in the disk-flowers obsolete.—Sphæromeria argentea, *Nutt.! l. c.*

Rocky Mountains, near the sources of the Platte and Colorado of the West, *Nuttall!* July.—Shrub 4–5 inches high. Leaves half an inch long. Flowers bright yellow.

‡ *Doubtful Species.*

5. *T. pauciflorum* (Richards.): stem simple, with a single terminal head, and sometimes another from the uppermost axil, longer than the bipinnate and tripinnatifid villous sessile leaves; the lobes narrow, rather obtuse; flowers all perfect. *Richards. appx. Frankl. journ. ed.* 2. *p.* 30; *Hook. fl. Bor.-Am.* 1. *p.* 327; not of *DC.*

Woody country, between lat. 54° and 64°, *Richardson.*—A foot high.

156. ARTEMISIA. *Linn.; Besser; DC. prodr.* 6. *p.* 93.

Heads discoid, few–many-flowered, heterogamous, with the central flowers perfect (either fertile, or sterile by the abortion of the ovary,) and 5-toothed, and the marginal pistillate in a single series, with a tubular 3-toothed corolla; or sometimes homogamous, with the flowers all perfect. Scales of the involucre imbricated, mostly dry and with scarious margins. Receptacle

flattish or convex, naked or villous. Achenia obovoid, with a small epigynous disk, destitute of pappus.—Herbs or shrubby (bitter and mostly aromatic) plants; with alternate, usually pinnately cleft or dissected leaves, and small spicate or racemose heads; the spikes usually paniculate. Corolla yellow or purplish.

§ 1. *Receptacle naked: heads heterogamous; the disk-flowers sterile.*—DRACUNCULUS, Bess. (Oligosporus, *Less.*)

1. *A. pycnocephala* (DC.): suffruticose (ex *Bess.*); stems ascending or erect; leaves crowded, silvery-tomentose; the lower tripinnately divided, with linear lobes; the upper with somewhat ovate lobes; heads spicate or spicate-paniculate, crowded, hemispherical, many-flowered; scales of the involucre elliptical, rather obtuse, silky-villous, with broad scarious margins; sterile flowers hairy at the summit; the fertile glabrous.—*DC. prodr.* 6. *p.* 99; *Bess. in Linnæa*, 15. *p.* 102. Oligosporus pycnocephalus, *Less. in Linnæa*, 6. *p.* 524.

St. Francisco, California, *Chamisso*, fide *Besser*, *l. c.* Inadvertently given by De Candolle as a Siberian species.

2. *A. dracunculoides* (Pursh): perennial, mostly suffruticose, erect, branched, more or less canescently pubescent when young; cauline leaves narrowly linear, entire, or the lower, as well as the radical, often 3-cleft; heads small, globose, nodding, in paniculate racemes; scales of the involucre with scarious margins; the inner roundish, the outermost oblong.—*Pursh! fl.* 2. *p.* 742. A. Dracunculus, *Pursh*, *fl.* 2. *p.* 521. A. cernua, *Nutt.! gen.* 2. *p.* 143. A. dracunculoides var. glauca, *Bess.! in Hook. fl. Bor.-Am.* 1. *p.* 326. A. glauca *β.* fastigiata, *Bess. in DC. prodr.* 6. *p.* 97. A. inodora, *Hook. & Arn. bot. Beechey*, *p.* 150 *?*

α. tenuifolia: canescent or glabrous; leaves elongated, narrowly linear, attenuate at both ends.—A. dracunculoides, *Pursh! l. c.* (fide spec. cult.)

β. brevifolia: somewhat cinereous, or at length glabrous (either herbaceous or suffruticose); leaves short, narrowly lanceolate-linear, acute; the lower cauline 3-cleft, the radical sometimes 1–2 pinnately parted ?—A. Nuttalliana, *Bess. in Hook. l. c., & in DC. l. c. p.* 96.

γ. incana: suffruticose, silky-canescent throughout when young, but becoming glabrous with age; cauline leaves short, linear, obtusish, frequently 3-cleft (inflorescence and flowers unknown).

Missouri! common from near St. Louis to the Rocky Mountains! and north to the Saskatchawan! (*α.* & *β.*) *γ.* Sandy banks of Jacques River, &c., *Mr. Nicollet!*—A somewhat polymorphous species, nearly allied in some of its forms to A. Dracunculus. Leaves varying from 1 to 4 inches in length, seldom more than one or two lines in width.—Both Pursh's name, and that imposed by Nuttall, seem to have been overlooked by Besser and De Candolle.

3. *A. borealis* (Pallas): perennial, herbaceous, cæspitose, silky-villous or nearly glabrous; stem simple; leaves all but the uppermost petioled; the radical linear-lanceolate, entire at the base, 3–5-cleft at the apex, or 1–2-pinnately parted, with the lobes lanceolate or linear; the cauline 2-pinnately divided, with linear lobes; the floral elongated, undivided at the base [often entire]; heads spicate or racemose, paniculate, hemispherical; scales of the involucre elliptical, colored on the back. *Bess. in Hook. & DC.*—*Pall. itin.* 3, *t. Hh. f.* 1; *Less. in. Linnæa*, 6. *p.* 211; *Richards.! appx. Frankl. journ. ed.* 2. *p.* 30; *Bess.! in Hook. fl. Bor.-Am.* 1. *p.* 326; *DC.! prodr.* 6. *p.* 98.

β. Besseri: cinereous-silky; leaves all linear-lanceolate; heads villous externally, the lower pedicellate. *Bess.*—A. borealis, *α.* Pursh*ii*, *Bess. in DC. l. c.*, excl. syn. *Pursh.*

γ. Wormskioldii (Bess. l. c.): canescent and somewhat silky; leaves on short petioles; heads racemose; corolla a little hairy at the summit.—A. Grœnlandica, *Wormsk. fl. Dan. t.* 1585.

δ. spithamæa: either villous or pubescent when young, at length glabrous; cauline and floral leaves either 3–5-cleft, or linear and entire; heads spicate-racemose.—A. borealis *β.* Adamsii (leaves 3–5-cleft; peduncles hairy), *& η.* Schangini (cauline leaves entire and linear), *Bess. in DC. l. c.* A. spithamæa, *Pursh! fl.* 2. *p.* 522. (At length glabrous throughout; cauline and floral leaves linear, entire!)

Arctic America! from Greenland! (var. *γ.*) and Labrador! (*δ.*) to the North West Coast! the Rocky Mountains! and Oregon! Also Keweena Point, Lake Superior, *Dr. Houghton!*—A span high.

4. *A. Canadensis* (Michx.): perennial (or biennial?), glabrous or canescent; radical and lower cauline leaves 2-pinnately divided, petioled; the upper 3–7-divided, sessile; the segments linear or linear-lanceolate; heads (rather large) hemispherical or subglobose, in paniculate racemes; scales of the involucre ovate or oval, with scarious margins.—*Michx.! fl.* 2. *p.* 129; *Nutt.! gen.* 2. *p.* 144. A. campestris, *Pursh, fl.* 2. *p.* 521 (ex *Nutt.*); *Richards. appx. Frankl. journ. ed.* 2. *p.* 30. A. desertorum, *γ–η, Bess.! in Hook. l. c.* A commutata, *Bess. in DC. l. c.* (at least as to the American plant.) A. peucedanifolia, "*Juss. herb.; Bess. Drac. n.* 33;" *DC.! l. c.* A. Pacifica, *Nutt. in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 399.

Shores of the Great Lakes, from the St. Lawrence River to Lake Superior! and west to Missouri! Upper Platte! and Oregon! extending north to Hudson's Bay! and to the Arctic Circle.—Plant 1–2 or 3 feet high, erect or ascending, considerably variable, if all the Western forms really belong to this species; sometimes nearly glabrous except the young radical leaves; but frequently silky-canescent throughout; the leaves somewhat rigid. The heads also vary in size, but are larger than the following species.

5. *A. caudata* (Michx.): biennial? glabrous; stem erect, paniculate; upper cauline leaves pinnately, the lower and radical (often pubescent) 2–3-pinnately divided; the segments linear-setaceous, divaricate; racemes disposed in a strict elongated panicle; heads (small) erect, subglobose; exterior scales of the involucre ovate; the inner elliptical, scarious.—*Michx.! fl.* 2. *p.* 129; *Nutt.! gen.* 2. *p.* 144; *Ell. sk.* 2. *p.* 318; *DC. l. c.*

Barren woods and sandy soil, Illinois! and Missouri, and from the coast of New Hampshire! and New Jersey! to Georgia! Aug.–Sept.—Plant 2–6 feet high, strict.

6. *A. Lewisii:* herbaceous; leaves on the sterile stems crowded, sessile, bipinnately divided, villous (the pubescence deciduous?); the segments linear-filiform, spreading, entire or often 2–3-parted; heads small, few-flowered, in a large open panicle; involucre glabrous.—A. Santonica, *Pursh, fl.* 2. *p.* 521. A. variabilis *γ*? Americana, *Bess. in DC. prodr.* 6. *p.* 94, *& in Linnæa*, 15, *p.* 94 *&* 111.

Missouri, *Lewis.* (also *herb. Michaux.*) Sandy places between Fort Gibson and Fort Smith, Arkansas, *Dr. Engelmann!*—The specimen of Dr. Engelmann consists of a young leafy stem, and a panicle of the former year. The leaves of the former are not unlike those of A. caudata, but villous; those of the latter are small, pinnately 3–5-divided, glabrous; the segments setaceous. Involucre apparently glabrous; the inner scales ovate, with scarious margins.

7. *A. filifolia* (Torr.): canescent; stems very numerous from a thick woody base, paniculate at the summit; leaves much crowded or fascicled,

filiform; the lower mostly 3-parted; heads very small, crowded in virgate leafy panicles, tomentose, 3–4-flowered; two of the flowers pistillate and fertile; the others staminate and sterile; receptacle slightly fimbrillate-pilose.—*Torr.! in ann. lyc. New York*, 2. *p.* 211. A. Plattensis, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 397.

Plains of the Platte, very abundant, *Dr. James! Nuttall! Lieut. Fremont!* July–Aug.—Plant 1–3 feet high; the branches slender and virgate. Leaves 1–2 inches long, terete (revolute), very slender, white when young, becoming somewhat glabrous when old.

§ 2. *Receptacle naked: heads homogamous; the flowers all perfect and fertile.*—SERIPHIDIUM, Bess.

8. *A. cana* (Pursh): shrubby, much branched, densely canescent throughout; leaves linear-lanceolate, acute, flat, entire (the lowermost cuneiform and sometimes acutely 3-lobed), equally clothed with the close silky tomentum on both sides; heads obovoid-hemispherical, axillary, sessile, mostly glomerate or spicate-paniculate, 4–6-flowered; exterior scales of the involucre canescent; the inner scarious.—*Pursh! fl.* 2. *p.* 521; *Bess.! in Hook. l. c.*; *DC. prodr.* 6. *p.* 105. A. Columbiensis, *Nutt.! gen.* 2. *p.* 142, & *in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 398, excluding the habitat in part.

Plains of the Upper Missouri and Platte to the Rocky Mountains, *Lewis! Nuttall! Mr. Nicollet! Lieut. Fremont!* and plains of the Saskatchawan, *Drummond!*—The leaves of this well-marked species are very seldom in any degree lobed, although there are some obscure indications in Pursh's specimens, collected by Lewis. We believe it has not been found west of the Rocky Mountains; and Mr. Nuttall was mistaken in supposing it to be the "Wild Sage" of Lewis and Clarke's Travels, which so abounds in the woodless sterile plains of the interior of Oregon; so that the change of specific name was the more unwarrantable. The name of *Wild Sage* was doubtless applied indiscriminately to several of the ensuing shrubby species, which inhabit the region in question. But the plant given to Pursh by Lewis with this name is the A. integrifolia, *Pursh* (A. Ludoviciana, *Nutt.*), and was collected on the bluffs of the Missouri, Oct. 1, 1804, upon the homeward journey.

9. *A. tridentata* (Nutt.): shrubby, much branched, densely silvery-canescent; leaves crowded or fascicled, narrowly cuneiform, 3-toothed or 3-cleft at the apex, the teeth or short lobes obtuse and approximate; those of the flower-branchlets often linear and entire; heads obovoid, spicate-glomerate, disposed in dense compound panicles, 5–6-flowered; exterior scales of the involucre canescent, the inner scarious.—*Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 398. (from specimens not in flower.)

Plains of the Oregon and Lewis River (Rocky Mountains in herb.), *Nuttall!* Wind River Chain of the Rocky Mountains, *Lieut. Fremont!* Aug.—Shrub about a foot high, much branched. Leaves an inch or less in length, 3–4 lines wide at the apex, tapering to the base, both sides equally silvery-tomentose; the teeth or lobes either very short, or 2–4 lines long, seldom again toothed. Heads very numerous, smaller than in A. cana.

10. *A. arbuscula* (Nutt.! l. c.): dwarf, shrubby, tomentose-canescent; leaves short, cuneiform, 3-cleft; the lobes oblong, obtuse; the lateral often 2–3-lobed; heads globose-ovoid, 6–10-flowered, sessile, solitary or somewhat clustered, forming a slender interrupted spike or spicate panicle; scales of the involucre oval; the exterior tomentose, the inner scarious.

Arid plains of Lewis River, *Nuttall!*—Shrub 4–6 inches high; the flowering branches virgate and rather naked.

11. *A. trifida* (Nutt.! l. c.): shrubby, silky-canescent; leaves 3-parted towards the apex; the segments linear, obtuse; heads spicate, somewhat glomerate, in a simple panicle, obovoid, 8-flowered; exterior scales of the involucre ovate, canescent; the inner oblong, glabrous, with scarious margins.

β. rigida (Nutt.! l. c.): leaves rigid, more silky and shining; the segments rather acute.

Plains of the Rocky Mountains and Oregon, *Nuttall!*—Plant 6–8 inches high.

§ 3. *Receptacle naked (not hairy): heads heterogamous; the flowers all fertile.* —ABROTANUM, (Tourn.) Bess.

* *Perennial or shrubby.*

12. *A. Lindleyana* (Bess.): shrubby, canescent towards the summit; leaves nearly linear, canescently tomentose beneath; heads spicate-paniculate, somewhat hemispherical, erect; scales of the involucre canescent, scarious at the apex, the outermost foliaceous; corolla glabrous. *Bess. in Hook. l. c., & DC. l. c.*

a. legitima (Bess. l. c.): leaves entire, an inch to an inch and a half in length.

β. brevifolia (Bess. l. c.): leaves an inch long, in fascicles; the primary having probably fallen away.

γ. subdentata (Bess. l. c.): leaves linear-lanceolate, somewhat toothed at the apex; involucre white and tomentose.

δ. Coronopus (Bess. l. c.): leaves pinnatifid-toothed towards the apex.—A. pumila, *Nutt.?*

"North West Coast of America, *Douglas*, in *herb. Lindl.*", ex *Besser*. Probably from the interior of Oregon.—This species is unknown to us: perhaps the following, of which we have only seen an imperfect specimen, is one of its forms.

13. *A. pumila* (Nutt.): dwarf, herbaceous, perennial, slightly tomentose-pubescent; leaves scattered, linear, entire, or sparingly laciniate or incised towards the apex; heads sessile, subglobose, few, in a simple somewhat leafy spike; scales of the involucre scarious, slightly tomentose; the exterior ovate, the inner broadly oval; "flowers polygamous."—*Nutt.! in trans. Amer. phil. soc. l. c. p.* 399.

Lewis River, in the Rocky Mountains.—Stems simple, 6–8 inches high, from a somewhat woody base. Leaves an inch or more in length, scarcely a line wide; the teeth or lobes (one or two on each side) subulate. *Nutt.*

14. *A. pedatifida* (Nutt.! l. c.): dwarf, suffruticose, somewhat canescent or cinereous, cæspitose; leaves 3-parted; the lateral segments often 2–3-cleft, linear, obtuse; heads obovoid, sessile, bracteate, seldom clustered, few, in a simple spike; scales of the involucre ovate, pubescent, with shining scarious margins; corolla glabrous.

Arid plains of Lewis River, in the Rocky Mountains, *Nuttall!* Aug.—"A very distinct and peculiar species, with a stout woody root, sending out tufts of low stems, three or four inches high, terminating in spikes of 4–10 flowers." *Nutt.*

15. *A. longifolia* (Nutt.): herbaceous (frequently woody at the base), tomentose; flowering stems simple; leaves narrowly lanceolate-linear, elongated, acute, entire, with revolute margins, tomentose-canescent beneath, at length almost glabrous above; the lower occasionally 3–5-cleft or laciniate; the lobes linear; heads cylindric-ovate, somewhat glomerate, sessile, few-flowered; involucre tomentose.—*Nutt.! gen.* 2. *p.* 142, *& in trans. Amer. phil. soc. l. c.*; not of *Bess. in Hook. l. c. &c.*

Rocky situations on the Missouri from White River to the mountains, *Nuttall!* Mouth of Teton River, *Mr. Nicollet!*—A low, "very odorous" species; the leaves 3–4 inches long, 2–3 lines wide, tapering to an acute point.

16. *A. discolor* (Dougl.): suffruticose, erect or ascending; leaves somewhat bipinnatifid, canescently tomentose beneath; the lobes mostly linear, acute, with revolute margins, few and divergent; heads hemispherical, nodding, disposed in a virgate raceme; scales of the involucre scarious, oblong, the outermost lanceolate; corolla glabrous.—*Dougl.! in herb. Hook.; DC. prodr.* 6. *p.* 109. A. Ludoviciana, *Bess.! in Hook. l. c.*, not of *Nutt.*

Rocky Mountains towards Arctic America, *Richardson!* and interior of Oregon near the Spokan and Kettle Falls, *Douglas.*—Plant 8–12 inches high. Involucre at first tomentose, but at length almost glabrous.—There are two forms; one (from Richardson?) with the upper surface of the leaves more tomentose, and more slender lobes; the other, with the leaves almost glabrous above, and with the lobes shorter and broader.

17. *A. Ludoviciana* (Nutt.): perennial, canescently tomentose throughout, branched; leaves lanceolate, mucronate, both surfaces when young clothed with a white tomentum, beneath very densely so; the lower often incised, remotely and sharply serrate, or sparingly pinnatifid; the upper entire; heads ovoid, mostly sessile, erect, disposed in a strict leafy panicle; corolla glabrous.—*Nutt.! gen.* 2. *p.* 143; *DC. prodr.* 6. *p.* 110; *Bess.! in Linnæa*, 15. *p.* 104. A. integrifolia, *Pursh! fl.* 2. *p.* 520. A. Purshiana *β.* angustifolia, *Bess.! in Hook. l. c.; DC. l. c.*

β. latiloba (Nutt.): lower leaves dilated, deeply pinnatifid, or the upper trifid; the lobes and the upper leaves broadly lanceolate (pubescence of the upper surface deciduous).—*Nutt.! in trans. Amer. phil. soc. l. c. p.* 400.

γ. gnaphalodes: very tomentose-canescent throughout; leaves elongated lanceolate, entire, or sharply and irregularly serrate towards the apex.—A. gnaphalodes, *Nutt.! gen.* 2. *p.* 143; *DC.! prodr.* 6. *p.* 115.

δ. serrata: leaves lanceolate (pretty large), acute or acuminate, sharply but irregularly serrate from the middle to the apex, perfectly glabrous above, at least when old; heads becoming glabrous; otherwise exactly as in var. *γ.*—A. serrata, *Nutt.! gen.* 2. *p.* 142. (*herb. Lamb.! & herb. acad. Philad.!*)

ε. latifolia: tomentose-canescent throughout: leaves short, elliptical-lanceolate or somewhat cuneiform-oblong, usually very entire.—A. Purshiana *a.* latifolia, *Bess.! in Hook. fl. Bor.-Am.* 1. *p.* 323; *& in DC. l. c.* A. integrifolia, *Richards. appx. Frankl. journ. ed.* 2. *p.* 30.

Plains and dry banks of rivers, &c., from the shores of Lakes Huron! and Michigan! the Saskatchawan! Missouri! &c. west to the Rocky Mountains! and south to Texas! *β.* Rocky Mountains, *Nuttall!* Oregon, *Dr. Scouler!* (mentioned by Hooker under A. longifolia, *Bess. in Hook. fl. Bor.-Am.*) *γ. & δ.* Upper Great Lakes! Upper Mississippi! and Missouri! *ε.* Plains of the Saskatchawan, *Richardson! Drummond!* Wind River Chain of the Rocky Mountains, *Lieut. Fremont!* Aug.–Sept.—Plant 1–5 feet high, sometimes simple, variable as to the shape and size of the leaves, but all the forms passing into each other; with small and crowded, rather few-flowered, more or less tomentose heads. The broader leaves are more or less evidently feather-veined.

18. *A. Douglasiana* (Bess.): suffruticose? strict, canescent; leaves canescent beneath; the cauline lanceolate, acute, entire; heads spicate-paniculate, hemispherical; the panicle somewhat leafy; scales of the involucre elliptical; the inner scarious at the apex; corolla glabrous. *Bess. in Hook. l. c., & DC. l. c.*

Oregon, *Douglas.*—Differs from A. integrifolia by its wholly entire leaves,

large panicle, with smaller glomerate-spicate heads: from A. Purshiana [that is A. Ludoviciana] in its strict stem, acuminate (not mucronate) leaves, elongated branches of the panicle, larger heads, the involucre not canescent-tomentose, the whole plant less canescent, and the leaves green above. *Bess.* —We have a plant collected by Douglas, which accords with the above character, except that the upper surface of the leaves and the heads are clothed with a loose, woolly, but apparently deciduous pubescence.

19. *A. vulgaris* (Linn.): perennial, erect; leaves whitish-tomentose beneath: the cauline pinnatifid, with the lobes either laciniate, incised, coarsely serrate, or entire; the uppermost nearly linear and entire; heads spicate-paniculate, ovoid, nodding, at length erect; the panicle leafy and spreading; exterior scales of the involucre canescently tomentose; the inner scarious; corolla glabrous. *Bess.! in Hook. l. c., & DC. l. c.—Linn. spec.* 2. *p.* 848; *Engl. bot. t.* 978; *Michx.! fl.* 2. *p.* 128; *Pursh, fl.* 2. *p.* 522; *Nutt. gen.* 2. *p.* 144; *DC.! prodr.* 6. *p.* 112. A. heterophylla, *Nutt.! in trans. Amer. phil. soc. l. c.*—A dozen varieties of this polymorphous and widely diffused species are described by Besser and De Candolle; of which the American forms are,

a. vulgatissima (Bess. l. c.): lobes of the leaves linear-lanceolate, the lower scarcely incisely toothed; panicle ample, erect.

β. Kamtschatica (Bess. l. c.): cauline leaves bipinnatifid, with linear lobes, those of the lower ones toothed; spikes dense, branched at the base; the spikelets nodding; heads ovate; scales of the involucre with scarious margins, smooth and shining.

γ. Californica (Bess. in Linnæa, 15. p. 91), which is said to represent the opposite extreme, and to connect A. integrifolia with this species; the lower leaves being merely unequally 3-cleft.—A. integrifolia, *Less. in Linnæa, l. c.; Hook. & Arn. bot. Beechey, p.* 150.

δ. Mexicana: lower leaves pinnatifid, the upper trifid; the lobes, like the uppermost leaves and those of the branches, linear-lanceolate, very acute, entire, with revolute margins; the upper surface as well as the branches often canescent when young; heads small, tomentose-canescent; flowers fulvous.—A. Mexicana, *Willd.? DC. l. c.?* (*Cf. Bess. in Linnæa*, 15. *p.* 107.) A. vulgaris var. Americana, *Bess. in Linnæa, l. c. p.* 105, in part. (spec. *Engelm.*)

Waste places, var. *a.* (*Mugwort*) introduced from Europe, and more or less naturalized; but native in British America. From Vermont (*Dr. Robbins!*) we have a state with the leaves all pinnatifid, and the lobes broad and mostly obtuse; apparently like the plant described by Nuttall, from sequestered forests of North Carolina. *β.* Unalaschka, &c. *γ.* California, *Chamisso. δ.* Arkansas, *Dr. Engelmann! Dr. Leavenworth!* Texas, *Drummond! Dr. Riddell! Berlandier?*—The A. vulgaris, *Bess. in Hook. l. c.*, from Arctic America, and subsequently indicated as var. Americana, we cannot distinguish from A. Tilesii.

20. *A. Tilesii* (Ledeb.): perennial, erect; stem simple; leaves whitish-tomentose beneath, pinnatifid [or trifid]; the lobes lanceolate, acuminate, somewhat toothed; heads racemose-paniculate, crowded, globose, somewhat nodding; branches of the panicle short; scales of the involucre arachnoid-tomentose, scarious; corolla glabrous. *Bess.! in Hook. l. c., & DC. l. c.—Ledeb. in mem. acad. St. Petersb.* 5. *p.* 568; *Less. in Linnæa*, 6. *p.* 214; *Bess. in Linnæa*, 15. *p.* 106.

β. arctica (Bess. l. c.): leaves laciniate-pinnatifid; the lobes entire, short, obtuse; involucre pale, scarcely woolly when old.

γ. Unalaschkensis (Bess. in Linnæa, l. c.): leaves mostly deeply trifid; the middle segment very much larger than the lateral; all lanceolate, acute, slightly and unequally toothed [often entire]; flowers purplish-brown.

δ. elatior: leaves as in *γ.*; the lobes entire; heads as in *β.*, smoothish, in numerous more or less elongated racemes, forming an ample virgate-pyramidal panicle.—A. vulgaris, *Bess.! in Hook. l. c.*, in part. A. Indica *β.* Canadensis, *Bess. l. c.?* A. vulgaris *ββ.* Americana (as to the Northern plant), *Bess. in Linnæa*, 15. *p.* 105.

Arctic shores of Asia and America! to Unalaschka! *δ.* Subarctic America, *Richardson!*—A polymorphous plant, with larger (frequently 3 lines in diameter), more globose and racemose heads, and more scarious involucres than any form of A. vulgaris.

21. *A. Hookeriana* (Bess.): suffruticose, erect: leaves with their lower surface as well as the stem canescent; the cauline pinnatifid, their lobes, like the floral leaves, lanceolate, acute; heads globose, nodding, in a terminal thyrsoid and scarcely leafy panicle; scales of the involucre woolly, with scarious margins; the inner rounded. *Bess. in Hook. l. c., & DC. l. c.*

Rocky Mountains, *Drummond.*—Heads $1\frac{1}{2}$–2 lines long. Corolla purplish. Resembles a form of luxuriant A. vulgaris. *DC.*

22. *A. Michauxiana* (Bess.): herbaceous, erect; stem simple; leaves whitish-tomentose beneath, pinnatifid; the lobes of the lower ones incisely toothed, of the upper and also the floral leaves linear-lanceolate; heads racemose, globose, nodding; scales of the involucre glabrous, with the sides scarious and shining; corolla glabrous. *Bess. in Hook. l. c., & DC. l. c.*

Rocky Mountains, and on the Oregon, *Douglas.*—Plant with the aspect of A. vulgaris var. Mongolica. Raceme sometimes simple, sometimes branched at the base. *DC.*

23. *A. incompta* (Nutt.): herbaceous, glabrous, except the lower surface of the pinnatifid leaves, which is cinereous; their lobes (3–5) linear-oblong, entire (the lateral sometimes toothed?); heads subglobose, racemose-paniculate, erect, on short pedicels: scales of the involucre glabrous and shining, scarious; the exterior ovate; corolla glabrous.—*Nutt.! in trans. Amer. phil. soc. l. c. p.* 400.

Central chain of the Rocky Mountains, in Thornberg's Pass (about lat. 41°), *Nuttall!*—Plant 1–2 feet high. Remarkable for its smoothness; at first sight somewhat resembles some varieties of A. vulgaris, but is very distinct. *Nutt.*—Perhaps the same as the preceding, which is unknown to us.

24. *A. pachystachya* (DC.): suffruticose (herbaceous, *Nutt.*), woolly-sericeous throughout; stems simple; cauline leaves crowded and also fascicled in the axils, bipinnately divided, or simply pinnate and as if stipulate at the base; the lower pinnæ scattered, those at the apex crowded; lobes short, narrowly linear-lanceolate; heads subglobose, glomerate-spicate; the spikes crowded in a long spicate panicle, bracteate at the base; scales of the involucre ovate, villous on the back; the inner scarious; corolla glabrous.—*DC.! prodr.* 6. *p.* 114; *Nutt. in trans. Amer. phil. soc. l. c.* (under the name of A. pycnostachya.)

California, *Douglas*! Coast of Monterey, *Nuttall.*—The crowded panicle 1–2 feet long, composed of short sessile spikes. Heads 15–20-flowered.

25. *A. Richardsoniana* (Bess.); cæspitose; leaves somewhat silky [canescent]; the radical on long petioles, and with the lower cauline pinnately divided; the upper 3-cleft; lobes of the radical leaves 3–5-cleft, of the upper undivided, linear, obtuse; heads racemose-spicate, glomerate, globose; peduncles woolly at the summit; scales of the involucre fuscous, scarious, woolly on the back; corolla a little hairy at the summit (varies with the peduncles strict, and with the heads somewhat nodding). *Bess.! in DC. prodr.* 6. *p.* 117. A. arctica, *Bess.! in Hook. fl. Bor.-Am.* 1. *p.* 323, not of *Less.* A. cæspitosa, *Bess. in Hook. l. c.?*

From Bear Lake to the shores of the Arctic Sea, *Richardson!* Mt. Ranier,

Oregon, *Mr. Tolmie!*—Plant 4–6 inches high. The corolla is nearly glabrous in our arctic specimens, but decidedly hairy at the summit in that from Mount Ranier; in which the raceme is loose, the pedicels strict, but the heads a little nodding.

26. *A. Prescottiana* (Bess.): suffruticose, branched; leaves canescent beneath, with revolute margins, pinnatifid or trifid; the divergent lobes and uppermost leaves linear-filiform; heads spicate, globose, nearly erect; scales of the involucre with scarious margins, shining, scarcely pubescent; corolla glabrous. *Bess. in Hook. l. c., & DC. l. c.*

Oregon, *Douglas.*—Lower leaves 1½–2 inches long. *DC.*

27. *A. arctica* (Less.): herbaceous; stem simple; leaves nearly glabrous; the lower bipinnatifid, (petioled); the lobes linear-lanceolate, incisely toothed; heads large, globose, racemose, nodding; the apex of the peduncles and the base of the corolla hairy; scales of the involucre ovate-lanceolate, scarious, brown or blackish. *DC.! l. c.—Less.! in Linnæa*, 6. *p.* 213; *Hook. & Arn.! bot. Beechey, p.* 125; not of *Bess.* A. Chamissoniana, *Bess.! in Hook. fl. Bor.-Am.* 1. *p.* 324.

Arctic coast, *Richardson!* to Kotzebue's Sound! and Unalaschka! Woods in the Rocky Mountains, lat. 52°, *Drummond.*—According to Hooker, the specimens from the last-named locality are identical with A. Norwegica.

28. *A. glomerata* (Ledeb.): suffruticose, cæspitose, silky with white hairs; leaves on the simple tufted stems 3-parted and many-cleft; the upper cauline and the bracts cuneiform or oblong, pinnatifid; heads corymbose-capitate, globose, bracteate; scales of the involucre ovate-lanceolate, sphacelate, unequally toothed at the apex, whitish on the back; corolla hairy only at the summit. • *DC.! l. c.—Ledeb. in mem. acad. St. Petersb.* 5. *p.* 564; *Less.! in Linnæa*, 5, *p.* 212; *Bess.! in Hook. l. c.*

Kotzebue's Sound, fide *Hook. & Arn.! bot. Beechey, p.* 125: but we doubt whether the sterile tufts (which alone were collected), with densely imbricated, very villous, cuneiform, 3–5 cleft leaves, really belong to this species.

29. *A. globularia* (Cham. herb.): suffruticose at the base, cæspitose; stems simple, hirsute at the summit; leaves petioled, silky beneath, 3-parted; the lobes 3-cleft or entire, linear; heads racemose-capitate, globose; scales of the involucre oblong-lanceolate, woolly on the back, sphacelate at the apex; corolla glabrous.—*Bess. in DC. prodr.* 6. *p.* 116.

Unalaschka, &c., *Chamisso!*—Stems 3–5 inches long from a woody caudex. Involucre blackish. Corolla purple. *DC.*

* * *Biennial.*

30. *A. biennis* (Willd.): herbaceous, strict, glabrous; radical and lower cauline leaves bipinnately parted; the uppermost pinnatifid; the lobes linear, acute; those of the lower leaves sharply toothed or incised, of the upper mostly entire; heads globose, erect, spicate; the short spikes disposed in a strict leafy panicle.—*Willd. spec.* 3. *p.* 1842; *Pursh! fl.* 2. *p.* 522; *Nutt.! gen.* 2. *p.* 144; *Bess.! in Hook. l. c.; DC.! prodr.* 6. *p.* 120. A. annua? *Nutt. l. c.*

Ohio! Illinois! Tennessee! and Missouri! to the Upper Platte! Saskatchawan! and the Mackenzie River! Aug.–Oct.—Plant 1–3 feet high.

§ 5. *Receptacle villous (or naked?): heads as in* § Abrotanum: *achenia acutely ribbed, crowned with a minute squamelliform pappus!*—TANACEUM, Nutt.

31. *A. Californica* (Less.): shrubby, pubescent-canescent; leaves pinnately 5–7-divided, with very narrowly linear segments, which are rarely 2–3-cleft; the uppermost entire; heads in a simple or compound raceme, secund, nodding, on short pedicels, hemispherical; scales of the involucre elliptical, obtuse, with broad scarious margins, almost glabrous; corolla glabrous. *Less. in Linnæa*, 6. *p.* 523 (whence the above character is derived); *Hook. & Arn. bot. Beechey*, *p.* 150; *Bess. in Linnæa*, 15. *p.* 93 & 109. A. abrotanoides, *Nutt. in trans. Amer. phil. soc. l. c. p.* 399, ex char.

California, *Chamisso*, *Capt. Beechey*. At St. Barbara, *Nuttall*; where it is said to be common, to have much the appearance of A. Abrotanum, the branches canescent, the heads large, and the receptacle somewhat hairy.—De Candolle has omitted this species. Besser, who has recently examined the original specimens (*Linnæa*, *l. c.*), pronounces the plant a congener and near ally of his A. Fischeriana, differing only in the division of the leaves. He adds that the ovary is acutely 4–5-ribbed, one of the ribs winged, and the rather large disk crowned with 4 or 5 short membranaceous squamellæ.

32. *A. Fischeriana* (Bess.): shrubby, subcanescent; lower leaves biternately divided; the upper 3-cleft; segments filiform; uppermost leaves entire; heads racemose, secund, nodding, hemispherical; scales of the involucre ovate-elliptical, with scarious margins; corolla glabrous. *Bess. Abrot.*, & *in DC. prodr.* 6. *p.* 105.

β. vegetior (Bess. l. c.): leaves simply ternately divided; scales of the involucre all nearly glabrous.—A. foliosa, *Nutt.! in trans. Amer. phil. soc. l. c. p.* 397.

"St. Francisco, California.—Shrub 3 feet high, decumbent." *Besser, l. c.* who, under var. *β.*, remarks that the receptacle bears a dense wool, longer than the involucre; and that the acutely ribbed achenia are terminated by a membranaceous and somewhat lobed pappus; the epigynous disk therefore large, as in Tanacetum. Mr. Nuttall's plant (not in flower) is from Monterey. The leaves have smaller ones fascicled in the axils; which is said by Lessing to be the case in A. Californica.

§ 6. *Receptacle villous or hairy: heads heterogamous; the flowers all fertile: achenia not ribbed: pappus none.*—ABSINTHIUM, (Tourn., Gærtn.) Bess.

33. *A. Absinthium* (Linn.): suffruticose, erect, silky-canescent; leaves 2–3 pinnately parted; the lobes lanceolate, often incised, obtuse; heads hemispherical, racemose-paniculate, nodding; exterior scales of the involucre linear or lanceolate, silky; the inner broad, rounded, scarious.—*Engl. bot. t.* 1230; *Darlingt. fl. Cest. p.* 491; *DC. prodr.* 6. *p.* 125; *Oakes, cat. pl. Vermont, in Thompson, gazetteer.* Absinthium vulgare, *Lam.; Gærtn. fr. t.* 164.

Road-sides, naturalized in the Northern States! Also in Newfoundland, *DC.*—Bitter and odorous.—*Wormwood.*

34. *A. frigida* (Willd.): suffruticose, silky-canescent; cauline leaves pinnately divided; the segments linear, 3–5-cleft; heads small, racemose-paniculate, globose, nodding, exterior scales of the involucre canescent; the inner woolly, oblong; corolla glabrous. *DC.! l. c.*—*Willd. spec.* 3. *p.* 1838; *Ledeb. fl. Alt.* 4. *p.* 63, & *ic. Alt. t.* 462; *Bess.! in Hook. fl. Bor.-Am.* 1. *p.* 321.

δ. Gmelinana (Bess.! l. c.): branched fromthe base; lower pinnæ of the leaves simple and remote from the others, resembling stipules; segments narrowly linear.—A. frigida, *Pursh! fl.* 2. *p.* 521. A. sericea, *Nutt.! gen.* 2. *p.* 143. A. virgata, *Richards.! appx. Frankl. journ. ed.* 2. *p.* 30. Absinthium incanum, &c., *Gmel. fl. Sibir.* 2. *p.* 128, *t.* 62.

Dry hills and rocks, Saskatchawan! and Missouri! to the Rocky Moun-

tains, (Wind River Chain, at the altitude of 7000 feet, *Lieut. Fremont!*) and the Snake Country, *Mr. Tolmie*, (*Hook. & Arn.*) July–Aug.—Stems diffuse, 8–12 inches high.

A. Chinensis (or rather A. lagocephala, *Fisch.*) a plant of Siberia and Kamtschkatca, is probably incorrectly given by Pursh as a native of the North West Coast of America.

Div. 4. HIPPIEÆ, *Less.*—Receptacle naked. Heads monœcious; the pistillate flowers in the margin, the staminate in the centre. Style of the sterile flowers simple, truncate. Pappus none.

157. SOLIVA. *Ruiz & Pav. prodr. p.* 113, *t.* 24; *R. Br. in Linn. trans.* 12. *p.* 101; *DC. prodr.* 6. *p.* 142.

Heads many-flowered; the fertile flowers in several series, apetalous or nearly so; the staminate few in the centre, with a 3–6-toothed corolla. Scales of the involucre 5–10, in a single series. Receptacle flat, naked. Achenia obcompressed, with winged or callous margins, armed with the persistent rigid style, destitute of pappus.—Small depressed herbs (chiefly South American); with petioled pinnately divided leaves, and small sessile or rarely pedunculate heads.

1. *S. nasturtiifolia* (DC.): very low and depressed; leaves on short petioles, pinnately parted; the lobes 3–4 on each side, obtuse, entire; heads sessile; achenia cuneiform, villous at the apex, the callous margin tuberculate-rugose throughout. *DC. prodr.* 6. *p.* 142. Gymnostyles nasturtiifolia, *Juss. in ann. mus.* 4. *p.* 262, *t.* 61, *f.* 2. G. stolonifera? *Nutt.! gen.* 2. *p.* 185; *Ell.! sk.* 2. *p.* 473.

Damp sandy soils, in South Carolina, near the coast: perhaps introduced. This species is a native of Buenos Ayres, where it was collected by Commerson.—♃? *Ell.* (Feb.–May.) Angles of the achenium somewhat produced into spreading teeth.

2. *S. daucifolia* (Nutt.): hirsute-pubescent, diffuse; leaves bipinnately divided; the divisions crowded, mostly 3-parted; the lobes linear, acute; heads sessile; achenia obovate, minutely hairy throughout, slightly margined, even, minutely 2-toothed at the summit; the teeth incurved.—*Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 403.

Dry grassy downs within the limits, and in the immediate vicinity of St. Barbara, California, *Nuttall!*—About 2 inches high. Annual, according to Nuttall.

Subtribe 7. GNAPHALIEÆ, *Less., DC.*—Heads homogamous or heterogamous, discoid; the flowers all tubular; the pistillate mostly filiform. Anthers caudate at the base! Style in the perfect flowers with the branches not appendiculate; in the staminate mostly undivided. Pappus composed of capillary or setaceous bristles, or sometimes none.—Leaves mostly alternate.

CONSPECTUS OF THE GENERA.

* *Receptacle not chaffy.*

158. GNAPHALIUM. Heads heterogamous; the central flowers perfect, the marginal filiform. Pappus all capillary.

159. ANTENNARIA. Heads diœcious. Pappus of the sterile flowers clavate or thickened at the apex.

** *Receptacle chaffy, except in the centre.*

160. FILAGO. Heads heterogamous; the exterior flowers pistillate, filiform, subtended by the chaff of the receptacle (which is similar to the scales of the involucre), destitute of pappus; the central furnished with pappus.

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158. GNAPHALIUM. *Linn.* (excl. spec.); *Don, in trans. Wern. soc.* 5. *p.* 263; *Endl. gen. p.* 447.

Heads many-flowered, heterogamous; the flowers all tubular; the exterior pistillate, very slender, mostly in several series; the central perfect. Scales of the involucre imbricated, appressed, scarious or somewhat hyaline. Receptacle flat, naked. Style 2-cleft. Achenia somewhat terete, or more or less obcompressed. Pappus a single series of setiform or capillary scabrous bristles.—Herbs, or rarely suffruticose plants, mostly woolly or tomentose; with sessile or decurrent leaves, and glomerate, corymbose, or spicate heads. Scales of the involucre variously colored.

§ 1. *Pistillate flowers in several series, frequently more numerous than the perfect: achenia somewhat terete.*—EUGNAPHALIUM, DC.

* *Leaves decurrent: scales of the involucre not yellow.*

1. *G. decurrens* (Ives): stem stout, branched at the summit, clothed with a viscid pubescence; leaves linear-lanceolate, partly clasping, decurrent, mucronate-acute, granular-viscid and slightly scabrous above, the lower surface like the branches densely whitish-tomentose; heads subsessile, in dense corymbose clusters, on short leafy and very woolly branches; the scales of the yellowish-white scarious involucre oval, rather acute; achenia minutely scabrous.—*Ives! in Sill. jour.* 1. *p.* 380, *t.* 1; *Torr.! compend. p.* 288; *Beck! bot. p.* 178; *Hook. fl. Bor.-Am.* 1. *p.* 328; *DC.! prodr.* 6. *p.* 226.

Hills and fields, Canada and Northern States, from Massachusetts! and Vermont! to New Jersey!—Aug.-Sept.—2f Stem about 2 feet high.

2. *G. Californicum* (DC.): stem herbaceous, erect, arachnoid-tomentose, somewhat glandular below; leaves linear-lanceolate, acuminate, somewhat decurrent, glandular-puberulent and viscid both sides (the lower surface often clothed with a deciduous wool); heads in dense clusters; scales of the silvery-white scarious involucre oval or oblong, mostly obtuse.—*DC.! l. c. p.* 224; *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 403. G. decurrens, *Less. in Linnæa*, 6. *p.* 525; *Hook. & Arn. bot. Beechey, p.* 151, & *suppl. p.* 359; not of *Ives.*

β. ? scales of the involucre pale purple.—G. Sprengelii β. erubescens, *Nutt. l. c.*

California, Chamisso, *Douglas! Nuttall!* &c. April–May.— ① *Nutt.* Perhaps too near the preceding.

4. *G. Sprengelii* (Hook. & Arn.): herbaceous; leaves clothed with white wool on both sides; the lower spatulate, the upper linear; those of the branches somewhat decurrent; corymbs axillary and terminal, glomerate, pedunculate, of few heads; scales of the silvery and slightly brownish involucre oblong, scarcely acute, shining.—*Hook. & Arn. bot. Beechey, p.* 150. G. Chilense, *Spreng. syst.* 3. *p.* 480; *Less. in Linnæa*, 6. *p.* 525. G. decurrens *β. Hook.! fl. Bor.-Am.* 1. *p.* 328. G. luteo-album *β.* occidentale, *Nutt.! in trans. Amer. phil. soc. l. c.*

β. smaller; heads in a simple capitate cluster.—G. luteo-album, *Hook.! fl. Bor.-Am. l. c.*

California! and Oregon! apparently common. ① —Near G. Vira-vira of Chili. We know not how to distinguish the smaller states of this species from G. luteo-album, except that the heads are larger, and the achenia perfectly smooth under a lens, instead of minutely tuberculate. The involucre is often slightly yellowish.

4* G. luteo-album ... Gr. & R. Wright. l. 124

** *Leaves not decurrent: scales of the involucre never yellow: heads corymbose-clustered.*

5. *G. polycephalum* (Michx.): erect; leaves linear-oblanceolate, tapering at the base, with undulate margins, mucronate-acute, nearly glabrous or pubescent-scabrous above, woolly-tomentose beneath, as well as the stem; heads clustered at the extremity of the paniculate-corymbose branches, ovate-conical before expansion, then obovate; scales of the scarious ochroleucous involucre ovate and oblong, rather obtuse; perfect flowers few.—*Michx.! fl.* 2. *p.* 127; *Pursh, fl.* 2. *p.* 584; *Ell. sk.* 2. *p.* 325; *Hook.! fl. Bor.-Am.* 1. *p.* 328; *Darlingt.! fl. Cest. p.* 494; *DC.! prodr.* 6. *p.* 227. G. obtusifolium, *Linn. spec. ed.* 2. *p.* 1198 (*pl. Gronov.!*); *Willd.! spec.* 3. *p.* 1880. G. conoideum, *Lam. dict.* 2. *p.* 775.

β. stem villous-pubescent with viscid hairs; leaves varying from lanceolate to narrowly oblong.

Old fields and woods, Canada! to Louisiana! and Texas! common. Aug.–Sept.—① Plant fragrant, 1–2 feet high.

6. *G. uliginosum* (Linn.): low, woolly, diffusely branched; leaves lanceolate-linear, tapering at the base, tomentose on both sides, especially the uppermost; heads in terminal and sessile capitate clusters, subtended by leaves; scales of the involucre oblong, rather obtuse, scarious, often brownish; achenia smooth.—*Linn. spec.* 2. *p.* 856; *Fl. Dan. t.* 859; *Engl. bot. t.* 1194; *Michx.! fl.* 2. *p.* 127; *Pursh, l. c.*; *Hook.! fl. Bor.-Am.* 1. *p.* 329; *Darlingt.! l. c.*; *DC.! prodr.* 6. *p.* 230.

β. achenia minutely hispid-scabrous.—G. pilulare, *Wahl. fl. Lapp. p.* 205, *t.* 13! (*Less. in Linnæa*, 6. *p.* 525.)

Common in low grounds throughout the Northern, Middle, and Western States! and Newfoundland! Canada! Saskatchawan! Oregon! and California. July–Sept.—① Plant 4–6 inches high.—The forms with smooth and scabrous achenia appear to be equally abundant, and are undistinguishable, except by this character. The latter also occurs in Siberia, fide *Ledeb. fl. Alt.* 4. *p.* 57.—*Marsh Cudweed.*

7. *G. palustre* (Nutt.): low, very woolly; stem erect, branching; leaves spatulate-oblong or nearly linear, acute, tomentose both sides; heads crowded in terminal capitate very woolly clusters, which are leafy at the base; scales of the involucre whitish or brownish, scarious, linear, obtuse; achenia very minutely scabrous.—*Nutt.! in trans. Amer. phil. soc. l. c. p.* 403.

β. achenia perfectly smooth and glabrous.

Rocky Mountains, Oregon, California (and Chili), *Nuttall!* β. Sweet Water of the Upper Platte, *Lieut. Fremont!*—① Plant varying from an inch to a span high; allied to G. uliginosum.

8. *G. gossypinum* (Nutt.): white and floccosely woolly; stem nearly simple? erect; radical leaves spatulate-lanceolate, acute; the cauline crowded, linear, acuminate, sessile, narrower towards the base; heads conglomerate, sessile, terminal; scales of the ovate involucre yellowish, oval or oval-oblong, obtuse. *Nutt. in trans. Amer. phil. soc. l. c. p.* 404.

Shores of the Pacific near the mouth of the Oregon; rare, *Nuttall.*—① Plant 12–18 inches high, heavy scented, with the appearance of Helichrysum graveolens, somewhat glandular beneath the copious pubescence. *Nutt.*

9. *G. microcephalum* (Nutt.): suffruticose? white and densely woolly; stem erect, simple; leaves lanceolate, apiculate, sessile, narrower towards the base, nearly all similar; heads ovate, conglomerate in a short spike; scales of the involucre scarious, white and silvery, acute. *Nutt. in trans. Amer. phil. soc. l. c. p.* 404.

St. Diego, California: rare.—About a foot high. Leaves 1–1½ inch long, 2–3 lines wide, white on both sides, with a blackish apiculate point. Involucre very floccose at the base: perfect flowers about 5.—Allied apparently to G. lanuginosum; but strongly resembling some species from the Cape of Good Hope. *Nuttall.*

* * * *Leaves not decurrent: scales of the involucre never yellow: heads racemose-spicate.*

10. *G. purpureum* (Linn.): stems mostly simple or branched from the base, erect or ascending, tomentose; leaves oblong-spatulate or oblanceolate, mostly obtuse, mucronate, tapering to the base, somewhat arenose-woolly, but green above, densely tomentose and canescent beneath; heads in sessile clusters in the axils of the upper leaves, and spicate at the summit of the stem; scales of the involucre lanceolate-oblong, scarious, tawny or whitish, the inner often marked with purple; achenia minutely scabrous.—*Linn.! spec.* 2. *p.* 854 (ex syn. *Gronov.! & Dill. Elth. t.* 103); *Michx.! fl.* 2. *p.* 127; *Ell. sk.* 2. *p.* 325; *Darlingt.! fl. Cest. p.* 492; *DC.! prodr.* 6. *p.* 232. G. spathulatum, *Lam. dict. p.* 758. G. Americanum, *Willd. spec.* 3. *p.* 1887 (excl. syn. *Swartz. &c.*); *Pursh, fl.* 2. *p.* 525. G. Pennsylvanicum, *Willd. enum. p.* 867; *DC.! l. c.* G. hyemale, *Walt. Car. p.* 203.—Varies, with the clusters more spicate, and the pubescence closely appressed and silvery. G. spicatum (*Lam. l. c.?*) *DC.! l. c.* in part; *Nutt. in trans Amer. phil. soc. l. c.*

β.? *falcatam:* leaves nearly equally woolly on both sides, narrowly oblanceolate; the upper nearly linear.—G. falcatum, *Lam. l. c.? DC. l. c.* G. Americanum β., *Hook.! compan. to bot. mag.* 1. *p.* 96.

Sandy or gravelly soil, from the coast of New Hampshire! to Louisiana! and California, ex *Nuttall.* β. Louisiana! and Texas! July–Sept., or in the Southern States, March to June.—Root apparently annual, at least in the northern plant; but described as perennial by Muhlenberg, Elliott, Darlington, &c.; which appears to be the case in some southern forms of this variable species. Stem 6–20 inches high, slender. All the species of this subdivision are ill defined.

11. *G. ustulatum* (Nutt.): perennial, herbaceous, erect, canescently tomentose; stem simple, terete, floccose-pubescent; leaves oblong-spatulate, obtuse, mucronulate; the upper ones narrower, sessile (not decurrent); heads oblong, aggregated in the axils of the upper leaves into a continuous short and dense oblong spike; scales of the involucre lanceolate and linear, acute, brownish towards the points. *Nutt. in trans. Amer. phil. soc. l. c. p.* 405.

Plains of the Platte towards the Rocky Mountains, and near St. Barbara, California, *Nuttall*.—Said to be nearly allied to G. spicatum, and therefore perhaps not distinct from G. purpureum.

12. *G. sylvaticum* (Linn.): stem simple, herbaceous, erect, leafy, tomentose; leaves linear-lanceolate or linear, woolly beneath or on both sides; heads axillary, sessile [forming a leafy spike]. *DC. l. c.*—*Wahl. fl. Lapp. p.* 203; (*Fl. Dan. t.* 254 & 1229;) *Schkuhr, handb. t.* 243.

Greenland! and Labrador! (*Herb. Schweinitz!*) 4—Pursh is surely mistaken in giving this species as a native of New York and Canada; in stony woods.

§ 2. *Pistillate flowers in a single series: achenia obovoid, obcompressed.*—HOMALOTHECA, Endl. (Omalotheca, *Cass., DC.*)

13. *G. supinum* (Villars): cæspitose; flowering stems simple, slender, woolly above; leaves linear, woolly; heads oblong, solitary, or few and spicate-racemose; scales of the involucre lanceolate-oblong, acute, brown; achenia minutely hairy.—*Vill. Delph.* 3. *p.* 192; *Engl. bot. t.* 1193; *Hook. fl. Bor.-Am.* 1. *p.* 329. G. pusillum, *Hænke; Schkuhr, handb. t.* 267. Omalotheca supina, *DC.! prodr.* 6. *p.* 245.

Labrador, *Dr. Morrison*. Greenland, *Herb. DC.* Dry ravine of the Amonoosuck, White Mountains of New Hampshire, *Nuttall!* (where it has not since been found.)—4 Plant 2–4 inches high.

159. ANTENNARIA. *Gærtn.* (excl. spec.); *R. Br. in Linn. trans. l. c.*

Heads many-flowered, diœcious; the corolla tubular, 5-toothed, in the pistillate flowers filiform. Scales of the involucre imbricated, scarious, colored. Receptacle convex or nearly flat, alveolate. Style in the fertile flowers 2-cleft; in the staminate simple and undivided, or nearly so. Achenia nearly terete. Pappus a single series of bristles, in the pistillate flowers capillary, in the staminate clavate or barbellate at the apex.—Perennial tomentose-canescent herbs; with alternate entire leaves, and corymbose (or sometimes solitary) heads. Involucre white, rose-color, or brownish, never yellow. Corolla yellowish.

§ 1. *Fertile heads mostly with a few imperfect staminate flowers in the centre: pappus in the sterile plant somewhat obscurely clavate: stems erect, not cæspitose or stoloniferous.*—Margaripes, *DC.*

1. *A. margaritacea* (R. Br. l. c.): stem woolly-tomentose, corymbose at the summit; leaves linear-lanceolate, tapering to an acute point, 1–3-nerved, with revolute margins; the upper surface at first arenose-woolly; the lower tomentose; scales of the involucre nearly white, in the fertile plant obtuse, in the sterile rounded at the summit.—*Hook.! fl. Bor.-Am.* 1. *p.* 329; *DC.! prodr.* 6. *p.* 270. Gnaphalium margaritaceum, *Linn. spec.* 2. *p.* 850; *Michx.! fl.* 2. *p.* 127; *Engl. bot. t.* 2018; *Pursh, fl.* 2. *p.* 524; *Darlingt.! fl. Cest. p.* 494. G. Americanum, *Clusius, hist.* 1. *p.* 327, *f.* 3.

Dry woods and fields, Canada! Hudson's Bay, and Newfoundland! to the mountains of the Southern States! and west to the Rocky Mountains! Unalaschka! and Oregon! (Also naturalized? in Europe.) Aug.–Oct.—Stem 1–2 feet high. The sterile plant, which is scarcely known in Europe, is here nearly as abundant as the fertile.—*Everlasting*.

§ 3. *Heads entirely diœcious: pappus of the sterile flowers mostly strongly clavate: stems cæspitose, often surculose, or stoloniferous.*—Catipes, *DC.*

2. *A. luzuloides:* silky-villous throughout; sterile stems or stolons none; leaves linear, obscurely 3-nerved, tapering to the base; corymb compound, loose; sterile heads small; the exterior scales of the glabrous involucre short and rounded; the inner ones spatulate, with dilated and very obtuse white tips.

Oregon or Rocky Mountains. (*Drummond* or *Douglas.*)—Stem 10 inches high, slender, simple, clothed like the leaves with a close appressed silky pubescence. Leaves 2–3 inches long, 1–2 lines wide. Heads numerous (40–50) in an open compound corymb, not more than half the size of those of A. Carpathica: the scales of the involucre not sphacelate or eroded. Pappus not denticulate or scabrous; the tips very much dilated and spatulate.—Although most related to Hooker's striking var. pulcherrima of the following species, yet it has very much smaller and glabrous heads, and narrower leaves; and widely differs from the original A. Carpathica. We have only seen the staminate plant.

3. *A. Carpathica* (R. Br. l. c.): sterile stems not stoloniferous; leaves lanceolate, or the radical oblanceolate, 3-nerved, villous-tomentose; corymb capitate; involucre very woolly and turbinate at the base, brownish, the inner with elongated and shining sphacelate-scarious (often white) tips, which are obtuse in the sterile, but acute in the fertile heads. —*Bluff & Fing. fl. Germ.* 2. *p.* 348; *Hook.! fl. Bor.-Am.* 1. *p.* 329; *DC.! prodr.* 6. *p.* 269. Gnaphalium Carpathicum, *Wahl. fl. Carp. p.* 258, *t.* 3; *Koch, fl. Germ. & Helv. p.* 364. (Varies with the leaves nearly glabrous above, or woolly both sides. *Hook. l. c.*)

β. pulcherrima (Hook.! l. c.): tall (a foot or more high), and silky-tomentose throughout.

Island of Anticosti, *Pursh! Goldie.* On the higher Rocky Mountains, about lat. 52°, *Drummond!* and Mt. Rainer, *Mr. Tolmie!* *β.* Swamps of the plains among the Rocky Mountains, *Drummond!*—Heads 3–8, or in *β.* 8–15, in a close corymb. Pappus in the sterile flowers denticulate; the clavate tips either spatulate and obtuse, or lanceolate and acute.

4. *A. alpina* (Gærtn.): sterile stems short and ascending, or none; leaves villous-tomentose, at least on the lower surface; the radical spatulate, the cauline linear; heads 3–5 in a terminal cluster, nearly sessile; involucre woolly at the base; the livid inner scales mostly erose-denticulate, obtuse in the sterile, but acute or acuminate in the fertile heads.—*R. Br. l. c.; Less. in Linnæa*, 6. *p.* 221; *Hook.! l. c.; DC.! l. c.* A. Labradorica, *Nutt.! in trans. Amer. phil. soc. l. c. p.* 406. Gnaphalium alpinum, *Linn.; Wahl. fl. Lapp. p.* 203.

β. monocephala: heads solitary or rarely geminate.—A. monocephala, *DC.! l. c.*

Greenland and Labrador! Hudson's Bay! and along the Arctic regions to Kotzebue's Sound! Unalaschka! &c.—Smaller than the preceding. Pappus in the sterile plant strongly clavate.

5. *A. dioica* (Gærtn.): sterile stems stoloniferous; leaves silvery-tomentose-canescent on the lower or on both sides (commonly glabrous above); the radical spatulate, one-nerved or 3-nerved at the base; the cauline linear-lanceolate, appressed; heads several, in a capitate corymb; scales of the involucre with erose-denticulate mostly obtuse (white, ochroleucous, rose-color, or purple) tips; achenia perfectly smooth.—*Gærtn. fr.* 2. *p.* 410, *t.* 167; *Hook.! l. c.; DC.! l. c.* Gnaphalium dioicum, *Linn.; Engl. bot. t.* 267; *Wahl. fl. Lapp. p.* 202.

β. parvifolia: heads glomerate-capitate; leaves silvery tomentose-canescent on both sides; scales of the sterile involucre ochroleucous, of the fertile purple.—A. parvifolia, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 406.

Arctic America! and from Newfoundland! and Labrador to the Rocky Mountains! *β.* Black Hills of the Platte, *Nuttall!* Wind River Chain of the Rocky Mountains, *Lieut. Fremont!* (*α.* & *β.*)

6. *A. plantaginifolia* (Hook.! l. c.): sterile stems stoloniferous or flagelliform, the flowering simple and scape-like; leaves silky-villous on one or both sides when young, but when old glabrous above and canescent beneath; the radical petioled, oval or obovate-spatulate (usually large), 3-nerved; the cauline lanceolate, appressed; heads in a small crowded corymb; scales of the involucre with white (rarely purplish) erose or crenulate tips; those of the sterile plant obtuse, of the fertile narrow and mostly acute; achenia minutely glandular-papillose.—A. plantaginea, *DC.! l.c.* Gnaphalium plantaginifolium, *Linn.! spec.* 2. *p.* 850; *Willd. spec.* 3. *p.* 1884. (G. plantaginis folio, *Pluk. alm. t.* 348, *f.* 9.) G. plantagineum, *Murr. syst. p.* 748; *Pursh, fl.* 2. *p.* 525; *Ell. sk.* 2. *p.* 327. G. dioicum, var. plantaginifolium, *Michx.! fl.* 2. *p.* 128. G. dioicum & var. plantaginifolium, *Darlingt.! fl. Cest. p.* 494.

β. monocephala: stems shorter, bearing a single larger head. *Michx. l. c.* —Gnaphalium monocephalon, *Carpenter! mss.*

Woods and sterile knolls, &c. from Hudson's Bay! to Florida! Louisiana! and west to the Rocky Mountains! *β.* Louisiana, *Prof. Carpenter!* Near Philadelphia, *Mr. Lea!* &c. April–May: in the Southern States, Feb.–March.—Plant 4–10 inches high. Radical leaves often 2–3 inches long, and one or two wide. Pappus of the sterile flowers sparsely barbellate, more or less evidently thickened towards the apex.—*Plantain-leaved Cud-weed.*

7. *A. racemosa* (Hook.! l. c.): sterile stems stoloniferous; leaves tomentose beneath; the upper surface and the scape-like stem nearly glabrous; the radical oval or obovate-spatulate, petioled, somewhat 3-nerved; the cauline oblong or lanceolate; heads loosely racemose-paniculate; scales of the involucre nearly glabrous, greenish; those of the sterile plant obtuse; the inner of the fertile heads narrow and acute; achenia perfectly smooth.

Alpine woods of the Rocky Mountains (probably about lat. 52°), *Drummond!*—Fertile plant often a foot or more in height; the heads loosely disposed in a long racemose panicle. Pappus in the sterile heads minutely scabrous, very obscurely thickened above: the style slightly 2-cleft at the apex.

8. *A. dimorpha:* cæspitose, depressed, somewhat stoloniferous; leaves crowded on the short branches of the suffruticose caudex, oblong-spatulate or nearly linear, silky-villous; heads solitary, on short peduncles, scarcely exserted beyond the leaves; scales of the involucre brownish, the exterior woolly; the inner scarious, lanceolate, acute in the sterile, and acuminate in the fertile heads; pappus of the former capillary, sparsely and minutely barbellate towards the apex.—Gnaphalium (subgen. Omalotheca, § Heterophania) dimorphum, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 405.

Black Hills of the Platte; *Nuttall!* May.—Plant 1–3 inches high. Leaves an inch long; in the fertile plant 2–3 lines, in the sterile scarcely a line wide. Heads twice as large as in Gnaphalium supinum.—This plant appears to our view a genuine Antennaria; notwithstanding the capillary pappus of the sterile flowers; which, although not thickened even in the slight manner of the preceding species, is yet manifestly barbellate (under a lens) towards the apex.

160. FILAGO. *Tourn. inst. t.* 259; *Gærtn. fr. t.* 166; *DC. l. c. p.* 247.

Heads many-flowered, heterogamous; the central flowers tubular, 4–5-toothed; perfect, but often infertile; the others pistillate, filiform. Scales of the involucre few, mostly woolly. Receptacle columnar or turbinate, naked at the summit, where it bears the perfect and a portion of the pistillate flowers, chaffy at the margin or base; the scarious chaff resembling the proper scales of the involucre, each bearing in its axil a pistillate flower. Achenia nearly terete, smooth or minutely papillose. Pappus of the central flowers capillary; of the exterior caducous or none.—Annual tomentose herbs, usually branched; with alternate entire leaves, and small mostly glomerate or fascicled heads.

1. *F. Germanica* (Linn.): woolly-tomentose; stem dichotomous, the upper branches arising from the capitate sessile glomerules; leaves lanceolate, acute, erect, crowded; heads pyramidal; involucral scales and chaff cuspidate, the exterior woolly; the exterior pistillate flowers in several series, destitute of pappus.—*Linn. spec. ed.* 2. *p.* 1311; *DC.! prodr.* 6. *p.* 247. F. vulgaris, *Lam.* Gnaphalium Germanicum, *Linn. spec.* (*ed.* 1) 2. *p.* 857; *Fl. Dan. p.* 997; *Pursh, fl.* 2. *p.* 526; *Darlingt.! fl. Cest. p.* 493. Gifola vulgaris, *Cass. in dict. sci. nat.* Impia Germanica, *Bluff & Fing. fl. Germ.* 2. *p.* 342.

Old fields and roadsides, New York! to Virginia! introduced from Europe. July–Oct.—A span high. Heads aggregated in globose capitate clusters.—*Herba Impia. Cudweed.*

2. *F. Californica* (Nutt.): arachnoid-tomentose, paniculately branched from the base; leaves linear, spreading, mucronulate, the lower spatulate-linear; heads ovoid, in small capitate clusters; involucral scales and chaff all obtuse; the exterior strongly boat-shaped and very woolly; the innermost nearly glabrous; pappus of the exterior pistillate flowers none, of the central somewhat copious.—*Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 405.

β. tomentosa (Nutt.! l. c.): leaves and glomerules more crowded; chaff somewhat purplish.

St. Barbara, California, *Nuttall!*—A span high. Heads larger and more glomerate than in F. minima (F. montana, *DC.*), but smaller than in F. arvensis. Achenia papillose-scabrous.

3. *F. parvula:* canescently woolly; stem erect, simple, or slightly branched at the summit; leaves linear-lanceolate, cuspidate; heads ovate-conical, acute, somewhat clustered; involucral scales and chaff ovate, acutish; the exterior boat-shaped and very woolly; the innermost scarious, oblong, obtuse, nearly glabrous (yellowish); pappus of the exterior pistillate flowers none; of the central rather copious.—Gnaphalium? filaginoides, *Hook. & Arn. bot. Beechey, suppl. p.* 359; *Nutt.! l. c. p.* 404.

California, *Douglas, Nuttall!*—Stem slender, 4–6 inches high. Leaves small, tipped with a blackish conspicuous acuminate-cuspidate point; the uppermost linear-oblong and merely mucronulate. Achenia glandular-puberulent. Pappus scabrous—Although overlooked by the authors who have hitherto noticed this plant, pistillate flowers certainly exist in the axils of all the chaffy scales; and the species is closely allied to the preceding.

Subtribe 8. SENECIONEÆ, *Cass.*, *DC.*—Heads homogamous or heterogamous, never diœcious, discoid or radiate; the rays ligulate, in a single series. Receptacle scarcely ever chaffy. Anthers not caudate. Pappus capillary.

CONSPECTUS OF THE GENERA.

Div. 1. ERECHTITEÆ.—Heads discoid, heterogamous; the flowers all tubular. 433

161. ERECHTITES. Marginal flowers pistillate, very slender, 2–3-toothed.

Div. 2. EUSENECIONEÆ.—Heads homogamous, or heterogamous and radiate. 434

* *Scales of the involucre in one or two series.*

\+ Leaves alternate.

162. CACALIA. Heads discoid, 5–many-flowered. Achenia glabrous. Pappus scabrous. Flowers white or whitish.

163. SENECIO. Heads radiate or discoid, many-flowered. Pappus of very slender bristles. Receptacle flat or convex. Flowers mostly yellow.

164. TETRADYMIA. Heads discoid, 4- (rarely 5–9-) flowered. Pappus of copious denticulate bristles. Achenia villous with long denticulate hairs. Receptacle small.

165. CROCIDIUM. Heads radiate, many-flowered. Pappus of the disk-flowers barbellate, caducous; of the ray none! Receptacle conical!

\+ \+ Leaves opposite.

166. ARNICA. Heads radiate, many-flowered. Pappus barbellate or strongly denticulate, rather rigid. Receptacle flat.

* * *Involucre imbricated.*

167. LESSINGIA. Heads discoid, many-flowered, homogamous; the marginal flowers larger and radiatiform, deeply 5-lobed. Pappus scabrous, rather rigid. Achenia silky-villous.

Div. 1. ERECHTITEÆ, *DC.*—Flowers discoid, heterogamous; the marginal flowers tubular, pistillate.

161. ERECHTITES. *Raf.* (*fl. Ludov. p.* 65? excl. char.); *Less. syn. p.* 390; *DC. prodr.* 6. *p.* 294.

Heads many-flowered, discoid; the flowers all tubular; the marginal pistillate, with a very slender somewhat 2–3-toothed corolla; the others perfect, with the corolla 4–5-toothed. Scales of the cylindrical involucre in a single series, linear, acute, with a few calyculate bracteoles. Receptacle naked, somewhat papillose. Branches of the style tipped with a pubescent cone. Achenia oblong, striate, somewhat contracted at the apex. Pappus copious, of very fine capillary bristles.—Erect annual herbs (the genuine species American), with alternate simple leaves, and corymbose heads. Flowers whitish or yellowish.

1. *E. hieracifolia* (Raf.): somewhat hairy or glabrous; stem simple or paniculate above, striate-sulcate; leaves lanceolate-oblong, acute, unequally and sharply toothed or incised, tapering to the base, sessile; the upper often sagittate-auriculate at the base and partly clasping; involucre glabrous, subtended by small subulate-linear calyculate bracteoles.—*DC.! prodr.* 6. *p.* 294. E. hieracifolia, prælta, & elongata, *Raf.* Senecio hieracifolius, *Linn. spec.* 2. *p.* 866; *Michx.! fl.* 2. *p.* 119; *Pursh! fl.* 2. *p.* 529; *Ell. sk.* 2. *p.* 328; *Hook.! fl. Bor.-Am.* 1. *p.* 332; *Darlingt.! fl. Cest. p.* 498. S. Americanus altissimus, &c. *Herm. parad. Bat. t.* 226; *Pluk. phyt. t.* 112, *f.* 1. Cineraria Canadensis, *Walt.?* Neocis hieracifolia (& N. rigidula) *Cass. in dict. sci. nat.* 34. *p.* 387.

Moist waste places, Canada! Saskatchawan! and throughout the United States! &c.; particularly abundant in recent clearings, where the wood has been burnt (whence the popular name of *Fire-weed*). July–Sept.—A coarse weed, 1–5 feet high, with the aspect of a Sonchus. Pappus copious and very white. Corolla 10-nerved.

Div. 2. EUSENECIONEÆ, *DC.*—Heads either homogamous and discoid, or heterogamous and radiate; the rays pistillate.

162. CACALIA. *Linn.* (excl. spec.); *Schkuhr, handb. t.* 236; *DC. l. c.*

Heads 5-many-flowered; the flowers all tubular and perfect. Scales of the cylindraceous involucre 5–30, in a single series, often with a few bracteoles at the base. Receptacle flat, not chaffy, sometimes with a conical or scale-like appendage in the centre. Limb of the corolla expanded, deeply 5-cleft; the lobes usually furnished with a mid-nerve. Branches of the style tipped with a very short cone, or obtuse, usually with a ring of minute hairs. Achenia oblong, glabrous, not rostrate. Pappus of numerous capillary scabrous bristles.—Perennial herbs, mostly very glabrous; with alternate often petioled leaves, and corymbose heads. Flowers white, ochroleucous, or rarely rose-color.

§ 1. *Receptacle flat and naked.*—Eucacalia, *DC.*

1. *C. suaveolens* (Linn.): glabrous; stem striate-angled; leaves triangular-lanceolate, hastate, acute, unequally serrate-toothed; the cauline on winged petioles: heads in a compound corymb, 25–30-flowered; scales of the involucre about 12; bracts several, setaceous-linear, spreading—*Linn.! spec.* 2. *p.* 835; *Michx.! fl.* 2. *p.* 96; *Pursh, fl.* 2. *p.* 518; *Schkuhr, handb. t.* 236; *DC.! l. c.* Senecio suaveolens, *Ell. sk.* 2. *p.* 328.

Woods and along streams, Canada? New York (Avon, *B. D. Greene!*) and Connecticut, (Milford, *Dr. Robbins!*) to Virginia! the western part of Georgia! Kentucky! and Illinois! Aug.–Oct.—Plant 3–5 feet high. Radical leaves on long petioles; the large hastate lobes mostly obtuse, often 2-lobed. Branches of the style canaliculate, very obtuse.

§ 2. *Receptacle usually furnished with a central conical or scale-like appendage: involucre 5-leaved and 5-flowered, naked, or slightly and minutely bracteolate at the base.*—Conophora, *DC.*

2. *C. reniformis* (Muhl.): stem sulcate-angled; leaves petioled, green on both sides, palmately veined (often slightly hairy on the veins beneath), repandly angulate-toothed; the radical reniform; the cauline flabelliform, dilated; the teeth strongly mucronate; corymb compound, fastigiate.—*Muhl.! in Willd. spec.* 3. *p.* 1735; *Pursh, fl.* 2. *p.* 518; *Nutt. gen.* 2. *p.* 138; *DC. l. c.*

Rich damp woods, Pennsylvania! to North Carolina! along the mountains. Also in Illinois, *Michaux* (in a note under the following species), and Indiana, *Dr. Clapp!* Aug.–Sept.—Stem 4–9 feet high. Leaves ample, dilated; the radical often 2 feet wide; the margin angulate-incised and repand-toothed: the upper cauline either truncate, or more or less cuneate at the base. Heads 5-flowered, as correctly described in *Muhl. fl. Lancast. mss.*; not many-flowered, as stated by Willdenow. Scales of the involucre lanceolate-oblong, obtuse. Receptacle slightly, or not at all produced in the centre.

3. *C. atriplicifolia* (Linn.): stem terete, glaucous; leaves petioled, very glaucous beneath, palmately veined, angulate-lobed or toothed (the teeth mucronulate); the radical and lower deltoid-cordate or somewhat reniform; the upper rhomboid; the uppermost cuneate at the base; corymb compound, loose.—*Linn.! spec.* 2. *p.* 835; *Michx.! fl.* 2. *p.* 96; *Pursh! fl.* 2. *p.* 518; *Schkuhr, handb. t.* 236; *Ell. sk.* 2. *p.* 310; *Darlingt. fl. Cest. p.* 499; *DC.! l. c. p.* 329. C. Virginiana, &c. *Moris. hist.* 3. *sect.* 7. *t.* 15, *f.* 7. Senecio atriplicifolius, (& *β.* reniformis?) *Hook. fl. Bor.-Am.* 1. *p.* 332.

Moist woodlands, Upper Canada to Georgia! and Missouri! July–Sept.—Stem 3–6 feet high. Radical and lower cauline leaves 4–6 inches long: the lobes or teeth triangular, mostly acute. Scales of the involucre lanceolate-oblong, obtuse. Receptacle produced in the centre into a lanceolate somewhat chaffy appendage, which is usually larger than the achenia, and 2–3-cleft at the apex, as if composed of as many confluent paleæ; but is often much shorter, or even inconspicuous.—*Indian Plantain.*

4. *C. diversifolia:* stem striate-angled; leaves petioled, green on both sides, somewhat tripli-nerved, veiny; the lower ovate, obtuse, slightly cordate, obtusely angulate-toothed or repand; the upper 3–5-lobed, somewhat hastate; corymb compound, loose.

River swamps, Middle Florida, *Dr. Chapman!* May.—Plant 2–3 feet high, not glaucous. Leaves nearly as large as in C. atriplicifolia; the upper on short but naked petioles; the lateral lobes lanceolate, acute, entire, or with one or two teeth. Heads, &c. as in the preceding. Receptacle slightly produced in the centre.

5. *C. ovata* (Walt.? Ell.): stem terete; leaves glaucous beneath, tripli–quintupli-nerved and veiny, ovate or oval, obtuse, entire or slightly and irregularly repand-toothed; the lower and radical tapering into long, the upper with short margined petioles; the uppermost sessile; corymb-compound loose, fastigiate.—(*Walt. Car. p.* 196?) *Ell.! sk.* 2. *p.* 311; *DC. l. c.*

Damp woods, western part of Georgia! and Alabama! to Florida! and Western Louisiana! July–Aug.—Stem 3–4 feet high, quite terete, slightly glaucous. Leaves rather veiny than nervose, pale and glaucous beneath; the radical (on very long petioles) and lower cauline with the lamina 5–8 inches long; the upper smaller and less petioled. Scales of the involucre lanceolate-linear, rather obtuse. Receptacle with an obscure central projection, or none.—Walter's character "foliis nervosis utrinque vividibus" is more applicable to the following species; to which Elliott, if he had been acquainted with that plant, would probably have applied the name. Having, however, been appropriated, (perhaps correctly,) to the present species, it should retain the name.—Elliott calls the leaves *obtuse* in the character, but *acute* in the detailed description.

6. *C. tuberosa* (Nutt.): stem sulcate-angled; leaves green on both sides, strongly 5–7-nerved; the radical and lower cauline lanceolate-ovate or oval, obtuse or acutish, entire or repand-denticulate, tapering into very long petioles; the upper ovate or cuneate-oblong, usually toothed towards the apex, on short margined petioles; corymb compound, fastigiate.—*Nutt.! gen.* 2. *p.* 138; *DC. l. c.* C. paniculata, *Raf. ann. nat. p.* 15. C. pteranthes, *Raf. l. c.?*

Marshes and wet prairies, Ohio! Michigan! Illinois! and Upper Missouri! to Arkansas! Louisiana! Western Alabama! and Florida! May–July.—"Root a round tuber, similar to a small turnip," *Nuttall*, &c. (but some other botanists have not met with the tubers.) Stem 2–6 feet high. Leaves thickish, not at all glaucous; the radical resembling those of the common Plantain; the largest rarely subcordate: the upper either entire, or obtusely toothed, or even incised. Scales of the involucre oblong-linear, obtuse. Receptacle pointed with a short subulate appendage.

7. *C. lanceolata* (Nutt.): stem terete, virgate, slender, somewhat glaucous; leaves glaucescent, 3- (sometimes 5-) nerved, lanceolate or linear-lanceolate, acute, entire, or very sparingly and sharply toothed; the radical and lower tapering into slender petioles; the uppermost sessile; corymb loose.—*Nutt.! gen.* 2. *p.* 138; *Ell.! sk.* 2. *p.* 311; *DC. l. c.*

Wet places, Georgia! to Florida and Louisiana!—Stem 2–3 feet high. Leaves thickish, 3–6 inches long, 3–10 lines wide; the cauline often with one or two sharp spreading teeth on each side. Scales of the involucre linear, acutish or acute. Receptacle with a central scale-like appendage.

C. gigantea (Hort. Vindob.), *Schauer in Linnæa*, 16, *suppl. p.* 216 (1842), raised from seeds received from New Orleans, so far as the description extends, does not differ from C. atriplicifolia.

163. SENECIO. *Linn.*; *Less. syn. p.* 391; *DC. prodr.* 6. *p.* 340.

Heads many-flowered, either discoid with the flowers all tubular and perfect, or radiate; the rays pistillate. Scales of the involucre in a single series, or calyculate with a few accessory scales. Receptacle not chaffy, naked or alveolate. Branches of the style in the disk-flowers truncate, the apex only minutely penicillate. Achenia not rostrate or winged, often grooved or ribbed. Pappus of numerous very slender capillary bristles.—Herbs or shrubs (occurring in almost every part of the world); with alternate leaves, and solitary, paniculate, or corymbose heads. Flowers for the most part yellow.

In many species of this vast genus (especially in S. coronopus, S. spartioides, S. ampullaceus, and S. filifolius,) the short hairs or papillæ of the achenia open at the apex when moistened, and emit spiral threads of considerable size, which may be distinctly observed with a simple lens of low power.

* *Annual: rays none.*

1. *S. vulgaris* (Linn.): somewhat woolly or nearly glabrous; leaves pinnatifid and toothed, clasping; the lowest tapering into petioles; heads corymbose, nodding, discoid; the calyculate scales (about 10) appressed, much shorter than the proper scales of the involucre; achenia puberulent.—*Linn. spec.* 2. *p.* 867; *Fl. Dan. t.* 513; *Engl. bot. t.* 747; *Pursh, fl.* 2. *p.* 528; *Hook.! fl. Bor.-Am.* 1. *p.* 331; *DC.! prodr.* 6. *p.* 341.

Waste and cultivated grounds in the Northern States! introduced from

Europe. Also Hudson's Bay, Newfoundland, and Labrador, (*Hook.*) June–Oct.—A homely weed, a span to a foot high.—*Groundsel.*

* * *Annual: heads radiate.*

2. *S. lobatus* (Pers.): glabrous (or slightly floccose when young); stem striate; leaves somewhat fleshy, lyrate-pinnatifid or pinnately divided; the lobes mostly distant and opposite, rounded, crenate-toothed or incised; corymb (usually compound) crowded, fastigiate; involucre nearly ecalyculate; rays about 12; achenia minutely hispid on the 5 alternate (stronger) ribs.—*Pers. syn.* 2. *p.* 436; *Ell.! sk.* 2. *p.* 332. S. lyratus, *Michx.! fl.* 2. *p.* 120, not of *Linn. f.* &c. S. glabellus, *Poir. dict.* 7. *p.* 102. S. Carolinianus, *Spreng. syst.* 3. *p.* 559. S. Mississippianus, *DC.! prodr.* 6. *p.* 427. S. densiflorus, *Martens, in bull. acad. Brux.* 8. *p.* 67. S. Schweinitzianus, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 411.

Damp soils, rice-fields, &c. North Carolina! to Florida! Missouri! Louisiana! and Texas! common: flowering through the season.—Stem hollow. Leaves extremely variable in the degree of incision, and in the number and size of the segments; the uppermost leaves often auriculate-clasping and laciniate-incised; the lowest petioled.—*Butter-weed.*

3. *S. Coronopus* (Nutt.): glabrous, much branched; leaves all pinnatifid, auriculate-clasping, with a wide rachis and a few acute segments, those of the upper leaves denticulate; branches fastigiate, bearing few heads on elongated naked peduncles; scales of the campanulate involucre (about 20) smooth, carinate, with acute sphacelous tips; rays about 15, oblong, elongated; achenia cylindric, 10-ribbed, the ribs strigose; pappus about the length of the florets.—*Nutt.! in trans. Amer. phil. soc. l. c. p.* 213.

St. Barbara, California, *Nuttall!*—May.—Plant not glaucous. Rays bright yellow.—Mr. Nuttall inquires whether it may not be a variety of S. coronopifolius, *Desf.*, introduced by accident; and it does not differ in any essential points from the description of that species.

4. *S. Californicus* (DC.): glabrous, erect; stem nearly simple, somewhat angled, corymbose at the summit; radical leaves oblong, tapering into a petiole, entire; the cauline lanceolate, toothed, partly auriculate-clasping; corymb simple, somewhat crowded; scales of the campanulate slightly calyculate involucre 20, acuminate; rays about 20, several-nerved; the disk-flowers about 60; achenia velvety-villous [?]. *DC.! prodr.* 6. *p.* 426.

β. laxior (DC.! l. c.): corymb looser; rays 10–15; disk-flowers about 50; achenia more densely villous [?].

California, *Douglas.*—The so-called villosity of the achenia, in this species, is probably produced by the emission of spiral threads, when moistened.

5. *S.? flocciferus* (DC.): stems angled, glabrous, much branched from the base; leaves mostly radical, pinnately parted; the ovate acutely toothed lobes bearing here and there dense tufts of floccose hairs in their axils; cauline leaves few, at the origin of the branches; heads solitary terminating the branchlets; involucre glabrous, calyculate; rays almost none, deformed, pistillate, scarcely different from the disk-flowers; achenia glabrous. *DC. prodr.* 6. *p.* 426; *Hook. & Arn. bot. Beechey, suppl. p.* 360.

California, *Douglas.*—"The flowers are reddish; the ligulate florets appear to be in several rows, and gradually to pass into the tubular ones." *Hook. & Arn.*

* * * *Biennial: heads radiate, corymbose: involucre not calyculate.*

6. *S. palustris* (Hook.): stem erect, somewhat simple, villous; leaves broadly lanceolate, dentate-sinuate [or laciniately subpinnatifid], acute,

hairy or nearly glabrous; the upper partly clasping by a cordate base; heads corymbose at the summit of the stem or branches; pedicels not bracteolate; scales of the involucre about 20, in a single series, linear, acuminate; rays 20–21; achenia glabrous, with many narrow somewhat unequal ribs.—*DC.! prodr.* 6. *p.* 363; *Hook.! fl. Bor.-Am.* 1. *p.* 334. Cineraria palustris, *Linn. spec. ed.* 2. *p.* 1243; *Fl. Dan. t.* 573; *Engl. bot. t.* 151; *Schkuhr, handb. t.* 246; *Richards.! appx. Frankl. journ. ed.* 2. *p.* 31.

β. congestus (Hook.! l. c.): very woolly; stem simple (4 inches to a foot high); leaves linear-ligulate, undulate or sinuate-toothed; heads crowded or capitate.—S. congestus, *DC. l. c.* Cineraria congesta, *R. Br.! in Parry's 1st voy. appx. p.* 279; *Hook. & Arn.! bot. Beechey, p.* 126.

Saskatchawan! (also saline marshy margins of Devil's Lake, N. W. Territory, *Mr. Nicollet!*) to the Arctic Sea! Kotzebue's Sound! &c. the var. *β.* confined to the arctic regions, and Melville Island! July.—Rays pale yellow. Pappus very copious, at first scarcely longer than the tube of the disk-corolla, at length very much longer than the flowers.—To this species, as thus considered, may probably be referred S. Kalmii, *Less. in Linnæa,* 6. *p.* 244.

7. *S. Hookeri:* biennial? arachnoid-pubescent, at length somewhat glabrous; stem simple; radical and lowest cauline leaves ovate or spatulate-oblong, obtuse, repand-denticulate or entire, contracted into short margined petioles; the upper linear-lanceolate, acute, entire, sessile; heads numerous, in a contracted and dense simple corymb; scales of the involucre about 12, nearly glabrous; rays 8–9, oblong, short (bright yellow?); achenia glabrous; pappus rather shorter than the 10-nerved corolla of the disk.—S. integrifolia, *Hook.! fl. Bor.-Am.* (excl. syn.), not of *Nutt.* Cineraria integrifolia, *Richards. appx. Frankl. journ. ed.* 2. *p.* 31; not of *Jacq., Willd., Pursh, &c.*

Woody country from lat. 54° to the shores of the Arctic Sea, *Richardson.* Rocky Mountains (lat. 52°), *Drummond!*—Plants 6–12 inches high, with fibrous roots, clothed when young with loose woolly hairs. Heads smaller than in S. spathulæfolius. Leaves perfectly smooth when the pubescence has fallen.

* * * * *Perennial: heads corymbose, chiefly radiate.*

† Leaves entire or denticulate.

8. *S. spartioides:* glabrous throughout; stems suffruticose, very numerous from the same ligneous tap-root, rigid, corymbose at the summit, leafy; leaves fleshy, narrowly linear, perfectly entire, rather obtuse, sessile; heads (large and showy) fastigiate-corymbose, on short minutely bracteolate peduncles; the calyculate scales subulate, minute; scales of the cylindrical involucre about 12, lanceolate-linear, acutish; rays mostly 7, oblong-linear, elongated; achenia silky-canescent.

Upper Platte; on a steep sand-bank of the Sweet-water River, *Lieut. Fremont!* Aug.–Sept.—Stems a foot high, forming a dense tuft. Leaves 1–3 inches long, about a line wide, very numerous. Heads half an inch in length. Rays golden-yellow. Pappus as long as the disk-corolla.—A remarkable and handsome species.

9. *S. megacephalus* (Nutt.): clothed with a deciduous wool, at length almost glabrous; stem low, stout; leaves lanceolate, acute, entire or obscurely denticulate; the lowermost tapering into petioles; the upper linear-lanceolate and partly clasping; corymb of 3–5 very large heads; scales of the nearly ecalyculate villous-pubescent involucre linear, acuminate, not sphacelate; rays 10–12, (pale yellow), short; achenia glabrous; pappus as long as the corolla of the disk.—*Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 410.

Plains of the Platte, near the Rocky Mountains, *Nuttall!*—Plant 6–8 inches high. Heads very many-flowered, nearly an inch long.

10. *S. lugens* (Richards.): clothed with deciduous tomentose hairs, or nearly glabrous; stem simple, slender; leaves glandular-toothed, or often nearly entire, obscurely veined; the radical oblong-spatulate, tapering into short petioles; the cauline lanceolate and acute, partly clasping; corymb simple; involucre sparingly calyculate; the scales linear-lanceolate, acute, strikingly blackish-purple or sphacelate above the middle; rays about 12, oblong-linear, twice the length of the involucre; achenia glabrous.—*Richards. appx. Frankl. journ. ed.* 2. *p.* 31; *Spreng. syst.* 2. *p.* 558; *Hook.! fl. Bor.-Am.* 1. *p.* 332; *DC. l. c.* S. Kalmii, *Hook. & Arn.! bot. Beechey*, *p.* 126 (a stouter form).

Arctic America from Fort Franklin to the sea-coast, *Richardson!* and Kotzebue's Sound!—A foot high. Heads large; the calyculate bracteoles linear-subulate.

11. *S. exaltatus* (Nutt.): sparsely clothed with caducous villous hairs, at length glabrous; stem tall and robust, grooved, simple, naked above; leaves unequally crenate-denticulate (the teeth somewhat glandular), veiny; the radical and lower cauline broadly lanceolate-oblong, obtuse, on long petioles; the upper lanceolate, acute, partly clasping (sometimes deeply serrate, *Nutt.*); corymb compound, fastigiate, of very numerous (small) heads; involucre scarcely calyculate; the scales linear, with pubescent and slightly sphacelate or purplish tips; rays 6–8, oblong, short; achenia glabrous.—*Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 410. S. lugens, *Nutt. in jour. Acad. Philad.* 7. *p.* 31; not of *Richards.*

Plains of the Oregon and of the Platte, *Nuttall!* &c.—Stem 3–5 feet high; the umbelliform corymb containing numerous heads, which are smaller than those of S. lugens.

12. *S. cordatus* (Nutt.): more or less hairy, especially towards the base of the tall and stout sulcate-angled stem; lower leaves cordate-ovate, repandly serrulate or nearly entire, obtuse, on long petioles; the upper lanceolate, clasping, serrate; heads numerous, in a nearly simple corymb; scales of the campanulate involucre (about 15) linear, with dark and sphacelous pubescent tips; rays 5 or 6, oblong; achenia glabrous.—*Nutt. in trans. Amer. phil. soc. l. c. p.* 411.

Alluvial situations in Oregon, near the mouth of the Wahlamet. *Nuttall.* June.—Plant 2–3 feet high, evidently allied to the preceding species.

13. *S. fastigiatus* (Nutt.): sparingly arachnoid-tomentose when young; stem slender, at length glabrous, simple, angled; leaves lanceolate or linear-lanceolate, mostly obtuse and entire, tapering into petioles, tomentose-canescent, or at length nearly glabrous; the upper cauline linear, small, subsessile; heads (small) numerous, in a fastigiate (simple or compound) corymb; involucre scarcely calyculate; the scales (yellowish) linear-lanceolate; rays about 8, linear-oblong; achenia glabrous.—*Nutt. in trans. Amer. phil. soc. l. c. p.* 410.

Plains of the Oregon, near the Wahlamet, *Nuttall!*—Stem 2 or 3 feet high. Leaves rather thick and rigid, the lower a span long (with the petioles), sometimes sparingly serrulate towards the apex, the margins inclined to be revolute. Heads about as large as in S. aureus.

14. *S. integerrimus* (Nutt.): glabrous throughout; stem simple, striate; leaves entire (rarely obscurely repand-denticulate), somewhat fleshy; the radical and lowest cauline short, lanceolate-oblong, rather obtuse, tapering into a petiole; the upper small, lanceolate, acute, partly clasping; corymb simple or nearly so; involucre hemispherical, calyculate with a few loose

and slender subulate bracteoles; the scales (15–20) narrowly linear, acute; rays about 8, small; the disk-flowers 40–50; achenia striate, nearly glabrous.—*Nutt.! gen.* 2. *p.* 165; *DC. prodr.* 6. *p.* 432.

β. cauline leaves very small, except those near the base of the stem, which appears scapiform; heads very few.—S. integerrimus, *Nutt.! in trans. Amer. phil. soc. l. c. p.* 411.

Upper Missouri, *Nuttall, Mr. Nicollet!* *β.* Plains of the Platte towards the Rocky Mountains, *Nuttall!* May–June.—Stem 12–18 inches high. Radical leaves 3–5 inches long, and 1–2 wide. Heads 8–20, rather large: the calyculate bracts nearly equalling the involucre.

15. *S. hydrophilus* (Nutt.): very glabrous; stem simple, terete, striate, rather leafy; leaves (thickish) lanceolate, acute, entire (or obsoletely repand-denticulate), furnished with a prominent midrib; the radical and lowest cauline elongated, tapering into thickish somewhat clasping petioles; the others sessile, partly clasping; heads (small) numerous, in a compound naked corymb; the pedicels and involucre scarcely bracteolate; scales of the cylindraceous-campanulate involucre about 8, oblong-linear, obtuse, the tips purplish and somewhat sphacelate; rays 3–6, very small; the disk-flowers 18–25; achenia glabrous, obscurely angled.

α. stem stout; the corymbs (not fully developed) thyrsoid-paniculate.—S. hydrophilus, *Nutt.! in trans. Amer. phil. soc. l. c.*

β. stem slightly striate; corymbs fastigiate.

Margin of ponds, &c., in the Rocky Mountains along Ham's Fork of the Colorado of the West, *Nuttall!* *β.* Borders of a lake in the Wind River Chain of the Rocky Mountains, *Lieut. Fremont!* Aug.—About 2 feet high. Leaves much like those of Solidago sempervirens: the upper small and scattered. Bracteoles few and very minute.—Heads smaller than in S. integerrimus. Achenia not striate. Receptacle alveolate.

16. *S. lanceolatus:* glabrous (except the base of the stem, which is pubescent); stem tall, virgate, angled, simple or somewhat branched above, very leafy to the summit; cauline leaves uniform (thin), lanceolate, entire, acute at both ends, subsessile (the lowest petioled?); corymbs small and loose, terminal and from the axils of the upper leaves, paniculate; the slender peduncles and pedicels and the small heads sparingly bracteolate; bracteoles filiform-setaceous; scales of the cylindrical 15–20-flowered involucre 8–12, narrowly linear, acuminate; rays few and small; achenia (not striate?) glabrous.

Along the North Fork of the Platte, *Lieut. Fremont!*—Stem 3 feet high, slender, inclined to branch from the axils of the upper leaves, terminated by a narrow corymbose panicle. Lower cauline leaves wanting; the upper much longer than the internodes, 4–5 inches long, one-half to three-fourths of an inch wide, mucronulate; the margin somewhat revolute. Heads about as large as in S. Sarracenicus; and the attenuated bracteoles similar. Rays a little exceeding the disk. Pappus about the length of the corolla.

17. *S. ampullaceus* (Hook.): very glabrous; stem grooved, branched above; leaves fleshy, oblong, obtuse, entire or denticulate, partly clasping by a cordate base; the lowest spatulate; panicle corymbose; the peduncles in fruit much incrassated and turbinate at the base of the heads; involucre with a few minute setaceous bracteoles; rays 7–9, spreading; achenia slender, strigose-canescent.—*Hook. bot. mag. t.* 3487; *DC. prodr.* 6. *p.* 428.

Texas, *Drummond!*—Plant 2–3 feet high. Involucre at first cylindrical, at length enlarged at the base, as in Sonchus, about 20–30-flowered. The short strigose hairs of the achenia promptly emit long spiral threads when moistened.

† † Leaves sharply serrate-toothed: heads radiate.

18. *S. triangularis* (Hook.): glabrous throughout; stem tall; simple, striate, leafy; leaves deltoid-triangular-lanceolate, acuminate, very sharply and coarsely toothed, petioled; heads (large) in a fastigiate compound corymb; bracteoles and calyculate scales few, linear-subulate; scales of the cylindraceous involucre about 15, linear, sphacelate at the tip; rays 10–12; achenia glabrous.—*Hook.! fl. Bor.-Am.* 1. *p.* 332, *t.* 115; *DC. l. c. p.* 432.

β. smaller; leaves less acuminate, and less deeply and sharply toothed.

Moist prairies among the Rocky Montains, between lat. 52° and 55°, *Drummond!* β. Wind River Chain of the Rocky Mountains, about lat. 42°, at the altitude of 7000 feet, *Lieut. Fremont!*—A stout handsome species: the leaves about 3 inches long, unequally and incisely toothed, on distinct petioles, tapering from the remarkably truncate base to the acuminate apex. Heads half an inch long. Achenia not striate.

19. *S. Serra* (Hook. l. c.): herbaceous, erect, very glabrous; stem striate; leaves petioled, broadly lanceolate, acuminate, strongly and sharply toothed, mostly cordate at the base; the uppermost linear-lanceolate, acuminate at both ends; heads numerous in a compound corymb; the involucre furnished with linear-subulate accessory scales; rays 6–7, linear, remote, twice the length of the involucre; achenia glabrous. *DC.* (under the following name.)—S. longidentatus, *DC. prodr.* 6. *p.* 418.

Oregon; "common on the banks of the Wallawallah, Flathead, and Spokan Rivers, (2–3 feet high)," *Douglas.*—Flowers rather small, very numerous, in a dense corymbose panicle. Scales of the involucre scarcely sphacelate at the tip. *Hook.*—While we adopt the anterior name of Hooker, we copy the character of De Candolle; who alone has described the lower leaves. It is doubtless nearly allied to S. Sarracenicus.

20. *S. Andinus* (Nutt.): glabrous; stem angled, very leafy; leaves linear-lanceolate, sharply denticulate, acute at both ends, subsessile; heads (small) cylindraceous, forming a compound paniculate corymb; bracteoles and calyculate scales few, subulate-setaceous; rays 6–8, the disk-flowers about 20; achenia glabrous.—*Nutt.! in trans. Amer. phil. soc. l. c. p.* 409.

Vallies of the higher Rocky Mountains (lat. 41°), about 6000 feet above the level of the sea, *Nuttall!* July.—A foot high. Leaves 3–5 inches long, a half to three-fourths of an inch wide. Corymb often irregular. *Nutt.*—May not this be a subalpine form of the preceding?

† † † Leaves toothed: rays none.

21. *S. rapifolius* (Nutt.): very glabrous throughout; stems angled, paniculately branched, leafy; leaves thickish, oblong, unequally and very sharply toothed; the radical and lowest cauline oval or obovate-oblong, narrowed into a winged petiole, and often sparingly incised at the base; the upper clasping by a subcordate base; heads (small) in numerous small corymbs, on short many-bracteolate pedicels, slightly calyculate; the calyculate scales and bracteoles very small and subulate; scales of the cylindraceous about 15-flowered involucre 8–10, oblong, thickish; rays none; achenia glabrous.—*Nutt.! in trans. Amer. phil. soc. l. c. p.* 409.

Upper branches of the Platte near the Rocky Mountains, *Nuttall!* Sweet-Water River and North Fork of the Platte, *Lieut. Fremont!* Aug.—Plant 6–20 inches high. Cauline leaves 3–4 inches long, 1–2 wide, obtuse or acute, somewhat fleshy. Heads much smaller than in S. Cacaliaster. Scales of the involucre thickish, with hyaline margins, not sphacelate. Pappus rather shorter than the yellow corolla. Achenia striate.

22. *S. aronicoides* (DC.): stem herbaceous, simple, arenose-hirsute;

lower leaves ovate, tapering into a petiole partly clasping at the base, unequally toothed, glabrous above, arenose beneath; the upper sessile, oblong, acute, partly clasping by the auriculate somewhat adnate base, coarsely toothed, arenose on both sides; corymb terminal, crowded; the calyculate involucral scales about 10, acuminate, arenose; rays none; the tubular flowers 10–12; achenia glabrous.—*DC. prodr.* 6. *p.* 426.

California, *Douglas*.—Herb 8–10 inches high. Lower leaves 5 inches long, including the petiole. *DC.*

† † † † Radical leaves undivided; the cauline incised or pinnatifid: involucre nearly ecalyculate.

23. *S. aureus* (Linn.): glabrous, or mostly somewhat arachnoid-woolly when young; radical leaves orbicular or roundish-ovate, mostly cordate, crenate-serrate, petioled; the lower cauline lyrate; the upper lanceolate, laciniate-pinnatifid, sessile or partly clasping; the segments mostly toothed at the apex; corymb somewhat umbellate; rays 8–12; achenia glabrous.—*Linn. spec.* 2. *p.* 870; *Michx.! fl.* 2. *p.* 120; *Pursh! fl.* 2. *p.* 530; *Ell. sk.* 2. *p.* 331; *Bigel.! fl. Bost. ed.* 2. *p.* 307; *Hook.! fl. Bor.-Am.* 1. *p.* 333; *Darlingt.! fl. Cest. p.* 497; *DC.! prodr.* 6. *p.* 432. S. tussilaginoides, *Walt. Car. p.* 208. S. fastigiatus, *Schweinitz! in Ell. l. c.* S. gracilis, *Pursh! fl.* 2. *p.* 529; *DC.! l. c.* (a depauperate state.)—Earliest radical leaves, small and round, seldom cordate, on shorter petioles; the succeeding larger, on long petioles.

β. obovatus: radical leaves varying from roundish-obovate to oblong-spatulate.—S. obovatus, *Muhl. in Willd. spec.* 3. *p.* 1999; *Pursh, l. c.*; *Ell. l. c.*; *Darlingt.! l. c.*; *DC.! l. c.* S. aureus *β.* gracilis, *Hook.! l. c.*—A large state, with heads of unusual size, is S. Balsamitæ *β.* majus, *Hook.! l. c.*

γ. borealis: radical leaves thickish and somewhat coriaceous, obovate, cuneate-spatulate, and oval, mostly crenulate-toothed at the apex only, or some of them entire; stem short (5–12 inches high); corymb of few or numerous heads.—S. aureus, partly, *Hook.! l. c.* S. cymbalarioides, *Nutt.! in trans. Amer. phil. soc. l. c. p.* 412.

δ. discoideus (Hook. l. c.): rays wanting.—A rayless state of var. *β.* is S. elongatus, *Pursh! fl.* 2. *p.* 529; of var. *γ.* (from Labrador!) is S. pauciflorus, *Pursh! l. c.* (heads rarely solitary!): an Oregon plant, with some of the oblong radical leaves sinuate-toothed or lyrate is S. debilis, *Nutt.! in trans. Amer. phil. soc. l. c.:* an Arctic American form, with the primordial radical leaves often as in var. *γ.* but the succeeding thin, ovate, and sharply serrate-toothed (corymb of few or several heads) is S. discoideus, *Hook.! l. c.*

ε. Balsamitæ: glabrous or more downy; radical leaves oval, oblong, spatulate, and lanceolate (often varying greatly on the same individual, crenate or rather sharply crenate-toothed, some of them occasionally lyrate-incised; achenia either glabrous or strigose-puberulent on the angles.—S. Balsamitæ, *Muhl. in Willd.! spec. l. c.* (& *in fl. Lancastr. ined.*, when the achenia are said to be glabrous); *Pursh! l. c.*; *Darlingt.! l. c.*; *DC.! l. c.* excl. syn. S. Plattensis, *Nutt.! in trans. Amer. phil. soc. l. c.*—Specimens collected at the same time from the same locality, not distinguishable in any other respect, have the achenia either glabrous, or minutely hairy on the angles; the latter are most common.

ζ.? lanceolatus (Oakes): stem slender, loosely and sparingly corymbose at the summit; leaves thin, lanceolate-oblong; the radical on long petioles, unequally and sharply serrate, subcordate or cuneate at the base; the cauline few, sessile, laciniate-pinnatifid towards the base; rays 6–8; achenia glabrous.—*Oakes! in Hovey's mag., & in Thompson's gazetteer of Vermont.*

Arctic America! to Louisiana! and from Labrador! to Oregon! α. in swamps or meadows; β. in drier places; ε. in rocky places; γ. (and δ. chiefly) Arctic America! to the Rocky Mountains! &c. ζ. Cedar Swamp, Brownington, Vermont, *Dr. Robbins!* April–June.—A polymorphous species, 10–30 inches high; the S. Balsamitæ and S. obovatus pass by numerous transitions into the typical S. aureus.

24. *S. Elliottii:* at length glabrous; stem simple, often nearly naked; radical leaves thickish, oval-obovate or roundish, crenate-serrate, tapering into a winged petiole which is much shorter than the lamina, or nearly sessile; the cauline few and small, sessile, laciniate-pinnatifid; the upper reduced to bracts; corymb small; rays 9–12; achenia glabrous.—S. obovatus, *Ell. sk.* 2. *p.* 330 (as to the Southern plant described), not of *Muhl. &c.*

Pennsylvania? to Georgia! Florida! and Alabama! May.—About a foot high, the stem often scape-like and almost leafless, floccose-woolly when quite young. Radical leaves crowded, 2–3 inches in diameter, frequently coriaceous when mature, often sharply serrate or incised towards the narrowed base, occasionally sinuate-incised or almost pinnatifid. Heads as large as in S. aureus.

25. *S. tomentosus* (Michx.): clothed with a more or less deciduous canescent wool; radical leaves oblong or oval-lanceolate, mostly obtuse at both ends, crenate-toothed, on slender petioles; the upper sessile; corymb fastigiate; rays 12–15, elongated; achenia strigose-pubescent on the angles.—*Michx.! fl.* 2. *p.* 119; *Ell. sk.* 2. *p.* 329; *DC. prodr.* 6. *p.* 433. S. integrifolius, β. heterophyllus, *Nutt.! gen.* 2. *p.* 165.

β. smaller, very canescent; radical leaves obovate-spatulate and oval, tapering into short petioles, slightly toothed; the cauline incisely pinnatifid.—Cineraria heterophylla, *Pursh, fl.* 2. *p.* 528?

Virginia! to Georgia! Florida! & Arkansas! β. Blue Mountains (of Pennsylvania, *Pursh*) of Virginia, *Mr. Buckley!* April–June.—Stem 1–2 feet high, often nearly leafless, except at the base. Radical leaves on petioles 3–6 inches long, sometimes nearly entire, often sharply toothed near the base. Heads larger than in S. aureus.

26. *S. canus* (Hook.): tomentose and canescent throughout; radical leaves oblong-spatulate, tapering into short petioles, entire; cauline linear-lanceolate, sessile, partly clasping, sinuate-pinnatifid, or laciniate-toothed towards the base; corymb mostly simple; rays 8–12, short; achenia glabrous.—*Hook.! fl. Bor.-Am.* 1. *p.* 333, *t.* 116; *DC. l.c.* S. integrifolius, *Nutt.! gen.* 2. *p.* 165. S. Purshianus, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 412. Cineraria integrifolia β. minor, *Pursh! fl.* 2. *p.* 528, (excl. syn.) as to the Missouri plant.

β. upper surface of the leaves becoming somewhat glabrous. *Hook. l. c.*

Upper Missouri, *Lewis, Nuttall!* and Saskatchawan, *Drummond!* β. Lake Huron, *Dr. Todd.*—Plant 6–12 inches high, somewhat cæspitose; the leaves white with a persistent tomentum.—The achenia as figured by Hooker are sparsely hairy along the angles near the summit; which is not the case in any of the specimens (of Drummond or others) that we have examined.

† † † † † **Leaves** all pinnately parted: involucre calyculate.

27. *S. Douglasii* (DC.): clothed with a deciduous arenose-canescent pubescence; stem striate, leafy; leaves linear, acute, entire, or mostly furnished towards the base with 1–3 pairs of small and remote narrowly linear lobes, nearly glabrous when old, the margins revolute; heads few, in a naked and loose compound corymb; the subulate calyculate scales or bracteoles

nearly as long as those of the involucre; "achenia somewhat glabrous."—*DC.! prodr.* 6. *p.* 429.

California, *Douglas!*—Leaves 3 inches long, 2 lines wide. Rays 11–13; the disk-flowers about 60. *DC.*

28. *S. filifolius* (Nutt.): suffruticose, much branched; the branches diffuse, very leafy to the summit; leaves pinnately 5–9-parted; the segments very narrowly linear, entire, obtusish, often unequal, mostly with revolute margins; heads (rather large) corymbose, on short peduncles, calyculate with a few small subulate scales; rays about 7, linear, somewhat elongated; achenia strigose-canescent.

a. Jamesii: densely tomentose-canescent; the wool evidently more or less deciduous.—S. filifolius, *Nutt.! in trans. Amer. phil. soc. l. c. p.* 414. (Described from an imperfect specimen in *herb. Torr.*)

β. Fremontii: glabrous, or obscurely arachnoid.

On the Upper Missouri or Platte, *Dr. James!* *β.* On the Lower Platte, near the "Chimney," *Lieut. Fremont!* Aug.–Sept.—Segments of the leaves an inch or less in length, half a line wide; the rachis about the same width. Heads smaller than in the following species. Rays golden yellow.

29. *S. Riddellii:* glabrous throughout; stem terete, very leafy, corymbose at the summit; cauline leaves pinnately 5–9-parted; the segments narrowly linear, obtuse, entire, flat, somewhat dilated towards the apex, (thickish and rather rigid); heads (large and showy) on short peduncles, disposed in a compound corymb, calyculate with subulate scales; rays about 12, linear, elongated; achenia minutely puberulent.—S. fragrans, *Riddell! mss.*, not *Fisch.*

Texas, *Dr. Riddell!*—2f ? A stout species, apparently 1–2 feet high, leafy to the summit. Radical leaves unknown: cauline not at all auriculate or dilated at the base; the segments an inch or more in length, and 1–2 lines wide: the rachis about the same width, and entire. Heads much larger than in S. abrotanifolius: scales of the involucre 16–18, linear-lanceolate, not sphacelate, nearly the length of the disk. Rays golden yellow. Pappus very white, as long as the disk-corolla.

30. *S. eremophilus* (Richards.): glabrous; stem striate, tall, branching; leaves membranaceous, interruptedly pinnatifid, the lower somewhat bipinnatifid; the segments lanceolate or oblong-linear, unequal, acute, often toothed; heads in a compound corymb: the calyculate scales few and loose, nearly as long as the cylindrical involucre; rays (about 9) linear, spreading; achenia nearly glabrous.—*Richards.! appx. Frank. journ. ed.* 2. *p.* 31; *Hook.! fl. Bor.-Am.* 1. *p.* 334.

Woods of the Saskatchawan (*Drummond*) to Fort Franklin on the Mackenzie River, *Richardson!*—Stem 2–3 feet high. Leaves ample; the lower 5–8 inches long.

† † † † † † Leaves all bipinnately dissected: involucre nearly ecalyculate.

31. *S. Millefolium:* floccose-lanuginous when young, at length glabrous; stems striate, cæspitose, corymbose at the summit; leaves chiefly radical, petioled, bipinnately divided; the segments often 2–5-parted, linear, obtuse; cauline leaves few, sessile, irregularly 1–2-pinnately dissected; corymb dense, fastigiate, mostly compound; scales of the hemispherical minutely 1–2-bracteolate involucre about 20, linear; rays 9–12, oblong, short; achenia minutely hairy on the angles; pappus equalling the corolla of the disk.

Mountains of North and South Carolina: "Carolina, *Fraser*," *in herb. Lambert!* Whiteside Mountain, North Carolina, *Mr. Curtis!* Table Mountain, S. Carolina, *Mr. Buckley!* June.—2f A foot or more high. Leaves rather fleshy; the numerous segments 2–3 lines long. Heads smaller

than is usual in S. aureus. Scales of the involucre greenish, with scarious margins, not sphacelate.—Were this remarkable plant a northern species, it might be supposed to prove the S. Canadensis; which has never been recognized.

* * * * * *Perennial: heads radiate, solitary or nearly so.*

32. *S. resedifolius* (Less.): dwarf, glabrous; stems mostly simple and terminated with a single head, leafless above; radical leaves petioled; the exterior rounded, crenate-sinuate or lobed; the interior lyrate-pinnatifid, with the segments entire or 2–3-lobed; the cauline oblong, sessile, pinnatifid at the base, woolly in the axils; scales of the nearly ecalyculate involucre lanceolate; rays 12–13, elongated; achenia minutely and sparsely puberulent; pappus a little shorter than the corolla of the disk.—*Less.! in Linnæa*, 6. *p.* 243; *Hook.! fl. Bor.-Am.* 1. *p.* 333, *t.* 117; *DC.! prodr.* 6. *p.* 347. Cineraria lyrata, *Ledeb.! fl. Alt.* 4. *p.* 102 (var. with purplish involucre); *Reichenb. ic. bot. t.* 101; *Hook. & Arn.! bot. Beechey, p.* 126.

Arctic America from Kotzebue's Sound! to Fort Franklin! &c.—Stems 2–6 inches high, sometimes sparingly branched above. Heads rather large. —This is not improbably the S. Cymbalaria of Pursh.

33. *S. subnudus* (DC.): very glabrous throughout; stem simple, slender, nearly leafless above and usually bearing a single head; radical leaves obovate, toothed at the apex, on slender petioles; the cauline few, sessile, oblong, incised or somewhat pinnatifid, not woolly in the axils; scales of the slightly calyculate involucre linear-lanceolate, acuminate; rays 8–12, elongated; achenia glabrous, striate; pappus nearly equalling the corolla of the disk.—*DC.! prodr.* 6. *p.* 428; *Nutt.! in trans. Amer. phil soc. l. c. p.* 412.

Cascade Mountains on the Oregon, *Dr. Gairdner! Douglas!* Wind River Chain of the Rocky Mountains, at the altitude of 7000 feet and upwards, *Lieut. Fremont!* Aug.—Stems often decumbent at the base, 6–10 inches high, sometimes bearing 2 heads, which are about as large as in S. aureus. Limb of the radical leaves half an inch in length, occasionally somewhat lyrate.—Allied to the preceding.

34. *S. Fremontii:* dwarf, glabrous; stems ascending, leafy, often branching; the branches naked at the summit and terminated by a solitary head; leaves somewhat fleshy, obovate and spatulate-oblong, very obtuse, sometimes mucronulate; the upper sinuate-toothed or slightly lyrate, sessile; the lowest angulate-toothed or nearly entire, tapering into a short margined petiole; scales of the ecalyculate involucre in a single series, linear-lanceolate; rays 8–10, oblong-linear; achenia (immature) puberulent; pappus equalling the corolla of the disk.

On the Wind River Chain of the Rocky Mountains, just below the limits of perpetual snow, *Lieut. Fremont!* Aug.—Stems 3–5 inches high. Leaves an inch or more in length. Heads about half an inch in length; the cylindrical-campanulate involucre many-flowered, subtended by one or two small lanceolate bracteoles.

35. *S. frigidus* (Less.): stem simple, bearing a single head, glabrous, or clothed with deciduous floccose wool and blackish-purple hairs; leaves elliptical-oblong, obtuse, with short petioles [the cauline sessile and partly clasping], glabrous or hirsute; the margins revolute, entire or slightly denticulate; involucre ecalyculate, hispid with purple hairs; rays numerous, oblong-elliptical; achenia glabrous; pappus as long as the tube of the disk-flowers. *DC.*—*Less. in Linnæa*, 6. *p.* 239; *Hook.! fl. Bor.-Am.* 1. *p.* 334. *t.* 112; *DC. prodr.* 6. *p.* 347. Cineraria frigida, *Richards. appx. Frankl. journ. ed.* 2. *p.* 31; *Hook. & Arn.! bot. Beechey, p.* 126. C. atropurpurea, *Ledeb. in mem. acad. St. Petersb.* 5. *p.* 274.

Arctic America, from lat. 64°, to the shores of the Northern Sea! Kotzebue's Sound! &c.—Stems 1–5 inches high. Head large.—Varies greatly as to pubescence, and the short purplish hairs of the involucre are sometimes nearly wanting.

36. *S. Pseudo-Arnica* (Less.): glabrous or arachnoid-tomentose at the summit; stem erect, simple, leafy, bearing one or very few [very large] heads; lower leaves oval-oblong, repand-toothed, narrowed into a short petiole; the upper sessile, lanceolate; scales of the involucre in few series, the exterior linear, acuminate, as long as the interior; rays many-nerved; achenia glabrous; pappus scabrous, equalling the disk-corolla, *DC.—Less. in Linnæa*, 6. *p.* 240; *Hook.! fl. Bor.-Am.* 1. *p.* 334, *t.* 113; *DC.! prodr.* 6. *p.* 358. Arnica maritima, *Linn. spec.* 2. *p.* 885 (ex. *Less.*); *Pursh! fl.* 2. *p.* 528; *Hook. & Arn.! bot. Beechey, p.* 126. A. Doronicum, *Pursh, fl.* 2. *p.* 527? Cineraria carnosa, *Pylaie! herb.*

Labrador! and Newfoundland! to Kotzebue's Sound! and Unalaschka!—Stem stout, 2 inches to a foot high. Heads (1–4,) an inch or more in diameter.

‡ *Obscure species.*

37. *S. Canadensis* (Linn.): heads radiate; leaves bipinnate, linear. *Linn. spec.* 2. *p.* 869.

Canada, *Kalm.*—Stem erect, smooth. Leaves bipinnate, linear, glabrous; the uppermost simply pinnate. Corymb terminal, compound, fastigiate, yellow. Involucre rufescent. *Linn.*

38. *S. Kalmii* (Nutt.): heads paniculate; leaves pinnatifid, somewhat villous; the segments sinuate; stem herbaceous. *Linn. spec. ed.* 2. *p.* 1244, under the name of Cineraria Canadensis.

Canada, *Kalm.*—Like Cineraria maritima, but the leaves instead of tomentose are subvillous, especially beneath. Rays spreading, not revolute. Stem annual, not perennial. Involucre a little sphacelate at the apex. *Linn.*—We are inclined to suspect some mistake respecting the habitat of several Linnæan species said to have been collected in Canada by Kalm.

39. *S. Cymbalaria* (Pursh): radical leaves petioled, subrotund, truncate at the base, with the petioles appendiculate and somewhat lyrate; the cauline sessile, linear, incisely toothed; stem somewhat one-flowered. *Pursh, fl.* 2. *p.* 530.

North West Coast of America, *Nelson, in herb. Banks.*—May it not be the same with S. residifolius?

40. *S. pauperculus* (Michx.): dwarf; stem very simple, rigidly erect, somewhat naked; leaves all lanceolate, a few of the radical somewhat entire; the others sparingly incisely toothed or serrate [or subpinnatifid]; corymb of few [2–4] heads; involucre nearly glabrous; rays rather small. *Michx. fl.* 2. *p.* 120.

Canada near the Lakes, *Michaux.* Newfoundland, *Pylaie.* (*V. sp. in herb. Michx. & herb. Pylaie.*)—Plant 5–7 inches high.—Perhaps not different from the remarkable and ambiguous S. aureus *var.* lanceolatus.

S. ciliatus, Walt., is most probably Erigeron Canadense.

S. opuntiæfolius, Raf. fl. Ludov.

Cineraria Caroliniensis (Walt. Car. p. 207): heads paniculate; leaves petioled, oblong, denticulate, smooth; stem herbaceous.

164. TETRADYMIA. *DC. prodr.* 6. *p.* 440; *Deless. ic.* 4. *t.* 60.

Tetradymia & Lagothamnus, *Nutt.*

Heads 4- or sometimes 5–9-flowered; the flowers all tubular and perfect. Involucre of 4 or 5 (rarely 6) oval or oblong and obtuse coriaceo-chartaceous carinate-concave scales, somewhat in two series. Receptacle small, naked. Corolla with a slender tube and a deeply 5-cleft limb; the lobes linear, spreading, mostly furnished with an indistinct mid-nerve. Anthers exserted. Branches of the style tipped with a very short and obtuse puberulent cone. Achenia oblong, terete, villous with long and soft denticulate hairs. Pappus at first shorter than the corolla, composed of numerous strongly denticulate and rather rigid unequal capillary bristles.—Herbaceous? or shrubby canescently tomentose branching plants (natives of dry barren plains in and near the Rocky Mountains); the leaves linear, entire, sessile, alternate, often fascicled; the primary frequently converted into spines. Heads corymbose or racemose, and often clustered at the extremity of the branches, rather large. Flowers bright yellow.

§ 1. *Involucre of* 4–5 *scales,* 4-*flowered: the villous hairs of the achenia much shorter than the very copious pappus.*—EUTETRADYMIA.

1. *T. canescens* (DC.): herbaceous? unarmed; silvery-tomentose; leaves scattered on the simple stems or branches, narrowly linear, rather rigid, mucronate; peduncles as long as the racemose-corymbose heads; scales of the involucre 4.—*DC.! in Deless. ic. sel.* 4. *t.* 60, & *prodr. l. c.; Hook. & Arn.! bot. Beechey, suppl. p.* 360.

Interior of Oregon or California, *Douglas!*—Leaves an inch and a half long, scarcely a line wide, none of them fascicled or spinescent. Flowers fully half an inch long. Hairs of the achenia, as in all the species of this section, as long as or longer than the achenium, and strongly denticulate under a lens, especially the uppermost, which might readily be confounded with the pappus.

2. *T. inermis* (Nutt.): shrubby, much branched, unarmed, silvery-canescent; leaves thickish, short, linear-lanceolate or somewhat spatulate, obtuse or mucronulate-acute, either scattered or fascicled; heads corymbose-clustered, on short peduncles; scales of the involucre mostly 4.—*Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 415.

Dry barren plains west of the Rocky Mountains, particularly near Lewis River, *Nuttall!* Also east of the Rocky Mountains on hills of the upper part of the North Fork of the Platte, near Deer Creek; and on the Wind River Chain at the height of 7000 feet, *Lieut. Fremont!* Aug.—Shrub 1–3 feet high, not spinescent. Leaves 6–9 lines long, 1–2 wide, canescent with a close tomentum. Heads and flowers smaller than in the preceding species; to which some states are very closely allied.

3. *T. Nuttallii:* shrubby, much branched, woolly when young, canescent; primary leaves mostly converted into subulate spines; the others densely fascicled in their axils, thickish, linear-spatulate, obtuse, the tomentum somewhat deciduous; heads fascicled and in corymbose clusters, on very short peduncles; scales of the involucre 4–5.—T. spinosa, *Nutt.! l. c.*, not of *Hook. & Arn.*

Dry plains of Lewis River, with the preceding, and on Ham's Fork of the Colorado of the West; common, *Nuttall!* July.—Shrub 2–3 feet high, growing in tufts like a Furze. Spines sharp, spreading or recurved, half an inch or a little more in length, as long as the fascicled leaves. Heads and flowers nearly as in the preceding.

§ 2. *Involucre of* 5–6 *scales*, 5–9-*flowered: the soft villous hairs which densely clothe the achenia as long as the less copious pappus!*—LAGOTHAMNUS, Nutt.

4. *T. spinosa* (Hook. & Arn., l. c.): shrubby, much branched, decumbent; the branches and scattered or racemose heads very woolly; primary leaves converted into acerose often recurved spines; the others fascicled in their axils, very small, fleshy, linear, obtuse, glabrous.—Lagothamnus microphyllus & L. ambiguus, *Nutt.! in trans. Amer. phil. soc. l. c. p.* 416.

Snake Country, on Lewis River, *Mr. Tolmie.* Arid plains with the preceding, common, *Nuttall!* July–Aug.—Shrub 3–4 feet high. Leaves usually much shorter than the spines, 2–3 lines long, somewhat terete, always glabrous. Heads pretty large, on short peduncles, often nodding, most frequently 5-flowered. Pappus of about 30 bristles, which are unequal as in the preceding species, but are nearly concealed by the singular hairs of the achenia, which perfectly simulate a pappus, and with which they were apparently confounded by *Hook. & Arn. l. c.* These copious very white denticulate hairs only differ from those of true Tetradymia by their greater length, in this species nearly equalling the corolla and real pappus.

165. CROCIDIUM. *Hook. fl. Bor.-Am.* 1. *p.* 335, *t.* 118.

Heads many-flowered, radiate; the ray-flowers about 12, pistillate; the disk-flowers tubular, perfect. Scales of the involucre 8–12, oblong-ovate, herbaceous, with somewhat scarious margins, spreading, nearly in a single series. Receptacle oblong-conical, naked, papillose. Rays oblong; the ligule with a short filiform tube: the corolla of the disk with a slender tube and a campanulate 5-cleft limb; the lobes spreading. Branches of the style short; those of the ray very obtuse, nearly included in the tube; of the disk tipped with a flattened triangular appendage. Achenia obovoid-oblong, obscurely 5-angled, canescent with somewhat caducous clavate-papilliform hairs (which when moistened split from the apex into two valves, and emit two attenuated spiral threads); those of the disk furnished with a deciduous pappus of 15–20 strongly barbellate capillary bristles, rather shorter than the corolla; of the ray similar, but destitute of pappus.—A small annual, sending up numerous slender and mostly simple stems (a span high) from the same root, which are naked above, and bear solitary heads. Leaves loosely floccose-woolly when very young, at length glabrous except in the axils, which are lanigerous; the radical spatulate, somewhat toothed or incised; the cauline linear, sessile. Corolla of the disk and ray somewhat deciduous, bright yellow.

C. multicaule (Hook.! l. c.)—*Nutt.! in trans. Amer. phil. soc. (n. ser.)* 7. *p.* 441.

On rocks of the Oregon near Fort Vancouver, *Douglas!* &c., and at the mouth of the Wahlamet, *Nuttall!*—An elegant little plant, allied in several respects to Blennosperma.—Hooker's figure and description do not altogether correspond, and neither are correct as respects the achenia, which are not compressed, tuberculate, nor crenate-margined in our specimens; nor are they very smooth, except when the papilliform hairs fall away. When thrown into water, the spiral filaments which the latter emit form a gelatinous mass around the achenium.

166. ARNICA. *Linn.; Gærtn. fr. t.* 173; *Schkuhr, handb. t.* 248; *DC. l. c.*

Heads many-flowered, radiate; the ray-flowers pistillate, and often furnished with sterile stamens; the disk-flowers tubular, perfect. Scales of the campanulate involucre lanceolate, equal, somewhat in two series. Receptacle flat, fimbrillate or a little hairy. Tube of the corolla hairy; the limb in the disk-flowers 5-toothed. Style in the disk-flowers with long pubescent branches, either truncate or tipped with a short cone. Achenia terete, tapering to the base or fusiform, somewhat ribbed, commonly hairy. Pappus a single series of rather rigid barbellate or strongly scabrous capillary bristles. —Perennial herbs (of the colder regions of the northern hemisphere); with simple stems, bearing solitary or somewhat corymbose large heads. Leaves undivided, opposite! Flowers yellow.

1. *A. nudicaulis* (Ell.): hirsute; leaves all sessile, 3–5-nerved, very hirsute above, entire or slightly toothed; the cauline 1–2 pairs, small, remote, ovate or oblong; the radical clustered; heads several, on slender corymbose peduncles; achenia nearly glabrous.—*Ell.! sk.* 2. *p.* 333; *DC.! l. c.* A. Claytoni, *Pursh, fl.* 2. *p.* 527. Doronicum foliis plantaginis, &c., *Clayt.* D. acaule, *Walt. Car. p.* 205. D. nudicaule, *Michx.! fl.* 2. *p.* 121.

Damp pine barrens, &c., Virginia! to Florida! April–May.—Stem 1–3 feet high; the pubescence somewhat viscid. Rays 12–15, twice the length of the involucre, bright yellow. Achenia very slightly and sparsely pubescent when young, at length glabrous.

2. *A. angustifolia* (Vahl): more or less villous; stem bearing a single head; leaves lanceolate, acute, entire or sparingly denticulate, 3-nerved; the radical on short petioles; the cauline 1–3 pairs, sessile; involucre woolly; achenia hirsute.—*Vahl, fl. Dan. t.* 1524; *DC.! prodr.* 6. *p.* 317. A. montana *β.* alpina, *Linn. spec. ed.* 2. *p.* 1245; *R. Br.! in Parry's voy. p.* 279; *Richards.! appx. Frankl. journ. ed.* 2. *p.* 30; *Hook.! fl. Bor.-Am.* 1. *p.* 330. A. alpina, *Læst.; Wahl. fl. Suec.* 2. *p.* 530. A. plantaginea & A. fulgens, *Pursh! fl.* 2. *p.* 527.

β. Lessingii: achenia glabrous! (involucre turbinate; anthers blackish.) —A. alpina, *Less. in Linnæa*, 6. *p.* 325. A. angustifolia, *Hook. & Arn. bot. Beechey, p.* 126.

Greenland! Labrador! and the Arctic coast! to Saskatchawan! and the Upper Missouri and Platte, in and near the Rocky Mountains! *β.* Kotzebue's Sound! &c.—Plant 4–10 inches high; some of the northern states (such as A. plantaginea, *Pursh*, from Labrador, and those from the Arctic islands) too closely approaching A. montana; but the more southern forms appear quite distinct from that species.

3. *A. Chamissonis* (Less.): hirsute-pubescent; stem simple or sometimes branched above, bearing 3 or more heads, leafy to the summit; leaves (am-

ple) oblong-lanceolate, acute, sparingly denticulate or entire, tripli–quintuplinerved, pubescent or somewhat villous; the cauline 4–7 pairs, nearly equal, partly clasping; the lowest tapering to the base; rays short; achenia minutely hirsute.—*Less.! in Linnæa*, 6. *p.* 238; *DC.! l. c.* A. montana *a.*, *Hook.! l. c.* A. foliosa, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 407.

Unalaschka, *Chamisso!* Rocky Mountains on the Colorado of the West, *Nuttall!* to the Woody Country of Subarctic America, *Richardson!* &c.—Stem 1–2½ feet high. Leaves 3–5 inches long. Heads on slender peduncles. Pappus plumose-serrate. Achenia (in our original as well as other specimens) *less* hirsute than in A. montana.

4. *A. mollis* (Hook.): villous-pubescent; stem leafy, bearing 1–5 heads; leaves thin and flaccid, veiny, nearly glabrous when old, denticulate or toothed; the cauline 3–5 pairs, somewhat equal; the upper ovate-lanceolate and closely sessile; the lower lanceolate or oblong, narrowed at the base, or tapering into a margined petiole; scales of the hirsute involucre acuminate; achenia hirsute; pappus almost plumose.—*Hook.! fl. Bor.-Am.* 1. *p.* 331. A. lanceolata, *Nutt.! in trans. Amer. phil. soc. l. c. p.* 408.

Alpine rivulets of the (northern) Rocky Mountains, *Drummond!* Moist places on the White Mountains of New Hampshire, in the alpine and subalpine region, *Dr. Pickering! Mr. Oakes! Nuttall! Mr. Tuckerman!* Mountains of New York, near the sources of the Hudson River!—Stem 10–30 inches high; the internodes mostly longer than the leaves. Upper leaves obscurely 3-nerved from the broad base; the lower somewhat triplinerved; the radical oblong-spatulate, petioled; the upper varying from oblong-ovate and obtuse to lanceolate from a broad base, and tapering to an acute point. Heads smaller than in A. montana; the pappus nearly plumose to the naked eye.

5. *A. latifolia* (Bongard): stem sparingly hirsute-pubescent, or nearly glabrous, bearing 3–5 heads; leaves thin and flaccid, ovate, unequally and often very sharply serrate, veiny, minutely pubescent with short hairs above, glabrous (except the veins) beneath; the cauline about 3 pairs, often acute, sessile, or the lowermost somewhat petioled; the radical subcordate, obtuse, on slender petioles; scales of the involucre lanceolate, acuminate, hairy towards the base; achenia almost glabrous.—*Bong.! veg. Sitcha, l. c. p.* 147; *DC.! l. c.* A. Menziesii, *Hook.! fl. Bor.-Am.* 1. *p.* 331, *t.* 111; *Nutt. l. c.*

North West Coast, from Sitcha! Observatory Inlet! and Fort Vancouver! to the Rocky Mountains!—Stems 1–2 feet high. Peduncles slender. Scales of the campanulate involucre and the rays usually 11 to 14, in the Sitcha specimens as well as others; in which also the achenia are not perfectly glabrous, but pubescent with scattered hairs near the summit.

6. *A. cordifolia* (Hook.): stem sparingly villous, bearing 1–5 heads; leaves nearly all cordate, thin, nearly glabrous, veiny, very unequally and often incisely and sharply serrate; the cauline 2–3 pairs, mostly acute; the uppermost sessile, the others like the radical on slender petioles; scales of the involucre acuminate, villous when young; achenia hirsute-pubescent.—*Hook.! fl. Bor.-Am. l. c.* A. macrophylla, *Nutt. in trans. Amer. phil. soc. l. c.*

Vallies of the Blue Mountains of Oregon, *Douglas! Nuttall*, to the Spokan River, and the east side of the Rocky Mountains, *Drummond!*—Plant 10–20 inches high, often paniculate at the summit, bearing larger heads than the preceding (from which it is perhaps not sufficiently distinct), with about 12 large and long rays. Lower leaves often obtuse, and shorter than the hairy petioles. Achenia becoming glabrous towards the base.

7. *A. amplexicaulis* (Nutt.): sparingly pubescent, or at length glabrous, somewhat cæspitose, very leafy; cauline leaves 5–6 pairs, approximate,

ovate, acute, serrate-toothed, veiny, partly clasping; heads 3–5; scales of the involucre linear-lanceolate, acuminate, sparsely hirsute; achenia hirsute.—*Nutt.! in trans. Amer. phil. soc. l. c.*

Oregon, on rocks at the Falls of the Wahlamet, *Nuttall!*—About a foot high; the leaves, except the uppermost, much longer than the internodes, all closely sessile, 1–2 inches long. Rays small.

‡ *Species unknown to us (corolla glabrous).*

8. *A. obtusifolia* (Less.): radical leaves petioled, subspatulate, obtuse, 5-nerved, scabrous; the cauline elliptical; head solitary; scales of the hirsute involucre exceeding the disk, oblong-elliptical; corolla glabrous. *DC. l. c.—Less. in Linnæa*, 6. *p.* 238.

Unalaschka, *Chamisso.*—Stem 6–12 inches high, more or less hirsute. Heads as large as in A. montana: rays sulphur-color, short. Anthers blackish. *Less.*

9. *A. Unalaschensis* (Less. l. c.): radical leaves petioled, subspatulate, obtuse, serrate towards the apex, very scabrous; the cauline oblong-obovate; head solitary; scales of the hirsute involucre exceeding the disk, linear-lanceolate. *DC. l. c.*

Unalaschka, *Chamisso.*—Stem 6 inches high, leafless and hirsute-villous at the summit. Leaves quintupli-nerved. Heads as in the preceding; the rays deeper yellow. *Less.*

167. LESSINGIA. *Cham. in Linnæa*, 4. *p.* 203, *t.* 2, *f.* 2; *Less. syn. p.* 388, *f.* 17; *DC. prodr.* 5. *p.* 351.

Heads many-flowered, homogamous; the marginal flowers larger and radiatiform, obconical, deeply 5-lobed; those of the disk cylindrical-tubulose, 5-toothed. Involucre imbricated. Receptacle naked. Stamens and styles included. [Branches of the style tipped with a dense tuft of rather rigid hairs.] Achenia compressed, not beaked, silky-villous. Pappus a single series of scabrous reddish somewhat rigid capillary bristles.—A procumbent branching annual [tomentose and canescent when young], at length somewhat glabrous. Leaves alternate, thickish; the lowest pinnatifid, the upper toothed at the apex. Heads solitary, terminal and alar. Flowers yellow. *DC.*

L. Germanorum (Cham. l. c.)—*Hook. & Arn. bot. Beechey, suppl. p.* 351.

California, *Chamisso, Douglas.*—Plant with the aspect of an Asterea, but with the style of Senecioneæ. The specific name ought perhaps to be changed to *Californica.*

TRIBE V. CYNAREÆ. *Less.*

Heads homogamous or heterogamous, sometimes dicœcious. Style in the perfect flowers often nodose-thickened near the summit (sometimes penicillate at the node); the branches either distinct or concreted, puberulent externally; the stigmatic lines reaching their apex, where they are confluent.

CONSPECTUS OF THE SUBTRIBES AND GENERA.

Subtribe 1. CARLINEÆ.—Heads discoid, homogamous. Anthers caudate. Pappus mostly plumose. 452

168. SAUSSUREA. Pappus double; the few bristles of the exterior denticulate.

Subtribe 2. CENTAURIEÆ.—Heads discoid; the marginal flowers mostly neutral, usually much larger than the others. Pappus never plumose, sometimes wanting. 453

169. CENTAUREA. Achenia compressed. Pappus of filiform bristles, or none.

170. CNICUS. Achenia terete, strongly striate. Pappus triple, the exterior 10-toothed, the intermediate of 10 long bristles, the inner of 10 short bristles. Marginal sterile flowers small.

Subtribe 3. CARDUINEÆ.—Heads discoid, homogamous, sometimes diœcious. Anthers slightly or not at all caudate. Pappus of plumose or scabrous bristles. 455

171. CIRSIUM. Achenia smooth. Pappus plumose. Receptacle bristly.

172. CARDUUS. Achenia smooth. Pappus scabrous. Receptacle bristly.

173. ONOPORDON. Achenia rugose, 4-angled. Pappus barbellulate, united at the base into a corneous ring. Receptacle alveolate.

174. LAPPA. Achenia rugose. Pappus scabrous, caducous. Receptacle setose-fimbrillate. Scales of the involucre subulate, uncinate at the apex.

Cynara Scolymus, Linn. (the Artichoke) is said by Nuttall (*Gen. p.* 129) to be somewhat naturalized in some parts of Virginia.

Subtribe 1. CARLINEÆ, *Cass.*—Heads discoid, many-flowered, homogamous, never diœcious. Scales of the involucre in several series, often spinose. Anthers caudate; the tails hairy. Pappus usually plumose.

168. SAUSSUREA. *DC. in ann. mus.* 16. *p.* 107, & *prodr.* 6. *p.* 531.

Heads many-flowered; the flowers all tubular, similar and perfect. Scales of the involucre imbricated in several series, mostly not appendiculate. Receptacle flat, fimbrillate, or with persistent chaff. Corolla with a slender tube and a 5-cleft limb; the throat inflated. Anthers with setiform ciliate or villous tails. Achenia glabrous. Pappus double; the exterior of a few short and denticulate rigid bristles; the interior of a series of stout plumose bristles, which are slightly united at the base.—Herbs (natives of the colder regions of the northern hemisphere); with alternate leaves, and usually corymbose heads. Corolla purple or dark violet.

1. S. *alpina* (DC.): leaves flat, nearly glabrous above, villous-tomentose beneath; the lower ovate-lanceolate and somewhat toothed; the upper oblong-lanceolate and entire; heads few in a close corymb; scales of the cylindraceous involucre appressed, villous, unarmed; the exterior shorter. *DC.! l. c.—Ledeb. ic. Alt.* 1. *t.* 18; *Hook.! fl. Bor.-Am.* 1. *p.* 303.

Serratula alpina, *Linn.*; *Engl. bot. t.* 599. Circium montanum humile, &c., *Dill. Elth. t.* 70. *f.* 81.

β. *densa* (Hook.! l. c.): stem somewhat decumbent; leaves nearly glabrous, dense, nearly all narrowly lanceolate; corymb glomerate [inner scales of the involucre very acute].—S. alpina β. subacaulis, *Ledeb. ic. Alt. t.* 73?

γ. *viridis* (DC. l. c.): leaves somewhat glabrous on both sides, elongated lanceolate [or linear], acuminate at both ends, denticulate, shorter than the stem [inner scales of the involucre very acute].—S. alpina, *Hook. & Arn. bot. Beechey, p.* 126. S. alpina γ. remotifolia, *Hook.! fl. Bor.-Am.* 1. *p.* 303. S. monticola [printed S. multiflora in 1st ed.], *Richards. appx. Frankl. journ. ed.* 2. *p.* 29. S. angustifolia, *DC. l. c.?* (*Gmel. fl. Sibir.* 2. *p.* 78, *t.* 33?)

Arctic America; γ. from Kotzebue's Sound! and the coast between the Mackenzie and Coppermine Rivers, nearly to the Saskatchawan, *Richardson!* β. Higher Rocky Mountains, *Drummond!*—The American seem nearly to correspond with the two Siberian varieties as described by De Candolle. The salient teeth of the leaves in Hooker's var. β. are sometimes retrorse.

Subtribe 2. CENTAURIEÆ, *DC.*—Heads discoid, many-flowered; the marginal flowers usually neutral, with the corolla irregular, and much larger than the disk-flowers. Scales of the involucre imbricated, variously appendiculate. Achenia with a more or less lateral basilar areola. Pappus pilose, setose, or chaffy, never plumose, sometimes wanting.

169. CENTAUREA. *Linn.* (excl. spec.); *Less.*; *DC. prodr.* 6. *p.* 565.

Heads many-flowered; the ray-flowers mostly large and sterile, sometimes wanting. Involucre imbricated, various. Receptacle setose. Achenia compressed. Pappus occasionally wanting or nearly so, but usually composed of scabrous filiform bristles, in one or more series, the inner often smaller and somewhat connivent.—Herbs of varied aspect (chiefly natives of the Mediterranean region and of Middle Asia); with alternate leaves, and solitary heads.

§ 1. *Involucre nearly globose or depressed; the exterior scales with a coriaceo-scarious pectinate-fringed appendage; the inner longer and scarious: rays much longer than the disk: pappus of rigid nearly homogeneous scabrous bristles, somewhat in a single series, caducous: achenia with a nearly terminal areola* (natives of America!).—PLECTOCEPHALUS, Don.

1. *C. Americana* (Nutt.): stem erect, striate-grooved, sparingly branched, thickened under the heads; leaves sessile, glabrous, often scabrous; the lower oblong-ovate, repand-toothed; the upper lanceolate, acute; head (very large) not bracteate; scales of the involucre all with pectinate appendages; rays elongated; the segments very long and slender.—*Nutt.! in jour. acad. Philad.* 2. *p.* 117; *Bart. fl. Amer.-Sept. t.* 50; *Colla, hort. Ripul.* 1. *p.* 119, *t.* 6; *DC.! prodr.* 6. *p.* 575. C. Nuttallii, *Spreng. syst.* 4 (*suppl.*) *p.* 298. C. Mexicana, *DC. l. c.*? Plectocephalus Americanus, *Don, in Brit. fl. gard. ser.* 2. *t.* 51.

Western Arkansas, Louisiana, &c. *Nuttall! Dr. James! Dr. Pitcher! Dr. Leavenworth!* Texas, *Drummond!* Common in cultivation.—① Plant 2–3 feet high, with very large showy heads. Flowers pale purple.

§ 2. *Scales of the ovoid-globose involucre appendiculate; the appendages ciliate-fimbriate, or those of the innermost somewhat lacerate-scarious and roundish: ray-flowers often none: pappus wanting or nearly so!* (*corolla purplish or rarely white*).—JACEA, Cass.

2. *C. nigra* (Linn.): stem erect, branching; radical leaves petioled; the cauline sessile, lanceolate, entire, denticulate, or sparingly angulate-incised towards the base, scabrous; flowers all equal and perfect; pappus much shorter than the achenium.—*Fl. Dan. t.* 906; *Engl. bot. t.* 278; *Hook.! fl. Bor.-Am.* 1. *p.* 301; *DC.! prodr.* 6. *p.* 571; *Bigel.! fl. Bost. ed.* 3. *p.* 339.

Newfoundland! (perhaps indigenous.) Naturalized in the eastern parts of Massachusetts! July–Aug.—2f Flowers purple. Scales of the involucre black, with a stiff pectinate fringe.

§ 3. *Scales of the ovoid or subglobose involucre surrounded by a membranaceous serrate and ciliate margin: rays larger than the disk: pappus double, often short: heads not bracteate.*—CYANUS, Cass.

3. *C. Cyanus* (Linn.): floccose-tomentose; stem erect, branching; leaves linear, sessile, entire; the lower broader, tapering into a kind of petiole, and toothed or pinnatifid at the base; pappus shorter than the achenium. *DC. prodr.* 6. *p.* 578; *Darlingt. fl. Cest. p.* 435.

Old fields and roadsides, having escaped from gardens; sparingly naturalized in the Northern and Middle States. July–Aug.—① Flowers blue (varying to purplish or white), or those of the disk violet.—*Blue Bottle.*

§ 4. *Scales of the ovoid involucre coriaceous, imbricated; the middle ones ovate, and produced into a long spine, which is naked above but sparingly pectinate-spinulose at its base; the inner oblong and with a simple spine; the outermost spineless: rays* 3–5-*cleft, shorter than the disk: pappus double; the exterior rigid in several series; the inner short, regular, connivent* (*corolla yellow*).—MESOCENTRON, DC.

4. *C. Melitensis* (Linn.): stem erect, branched; radical leaves pinnately parted, tapering into a petiole; the cauline decurrent, broadly linear, toothed; heads solitary, ovate-globose, somewhat tomentose; innermost scales of the involucre acuminate-spinescent. *DC.! prodr.* 5. *p.* 593; *Hook. & Arn.! bot. Beechey, suppl. p.* 360. C. Partibilcensis, *DC. l. c., fide Hook. & Arn.*

California, *Douglas!* Probably introduced (as also into South America) with grain from Europe.

§ 5. *Involucre ovoid; the middle scales produced into a spine, which is pinnately spinulose at the base; the innermost scarious at the apex: rays equalling or exceeding the disk: pappus short or none* (*corolla purple*).—CALCITRAPA, *Cass.*

5. *C. Calcitrapa* (Linn.): stem diffusely much branched, hairy; leaves sessile, pinnately lobed; the lobes linear, acute, toothed; heads sessile among the uppermost mostly entire leaves; spines of the involucre strong, spreading, grooved above, with 2 or 3 small spinulæ on each side at the base; the

lowest involucral scales scarious and obtuse: pappus none. *DC. prodr.* 6. *p.* 597.

Naturalized in Virginia near Norfolk!— ① ②

C. Caroliniana, Walt. is doubtless Stokesia cyanea, *L'Her.*

170. CNICUS. *Vaill.; Gærtn. fr. t.* 162; *DC. diss. & prodr. l. c.*

Heads many-flowered; the ray-flowers sterile, slender, nearly equal to the disk. Scales of the ovoid involucre coriaceous, appressed, produced into a long and rigid pinnated spinose appendage. Receptacle densely clothed with capillary bristles. Achenia terete, smooth, strongly striate, with a large lateral basilar areola. Pappus triple; the exterior, or rather margin of the fruit, of 10 very short corneous teeth; the intermediate of 10 elongated subulate-filiform rigid bristles; the inner of 10 short bristles; the three series regularly alternating with each other.—An annual slightly woolly or villous branching herb (of uncertain nativity); with clasping and somewhat decurrent undivided subpinnatifid leaves, and bracteate heads. Corolla yellow.

C. benedictus (Linn.)—Centaurea benedicta, *Linn. spec. ed.* 2. *p.* 1296.

Sparingly introduced, but scarcely naturalized in New York, &c. Louisiana, *Mr. Leavenworth!* It has also been found in Mexico and Chili, to which it was probably brought from Southern Europe.

Subtribe 3. CARDUINEÆ, *Less., DC.*—Heads discoid, homogamous, many-flowered; the flowers all similar. perfect or diœcious. Scales of the involucre imbricated in several series, often spinose at the apex. Corolla usually curved outwards, the exterior lobe often deeper cleft than the others. Anthers slightly or not at all caudate. Achenia glabrous, with a terminal areola. Pappus composed of slender scabrous or plumose bristles, which are often united into a ring at the base.

171. CIRSIUM. *Tourn.; DC. fl. Fran. ed.* 3, & *prodr.* 6. *p.* 643.

Heads many-flowered; the flowers perfect and similar, rarely subdiœcious. Scales of the involucre imbricated in numerous series, mostly cuspidate or tipped with a prickle. Receptacle bristly. Corolla regularly or often unequally 5-cleft. Anthers more or less produced and lacerate at the base: filaments often hairy. Branches of the style concreted nearly to the apex. Achenia oblong, compressed, glabrous, not ribbed. Bristles of the pappus numerous and somewhat unequal, united into a ring at the base, plumose, merely denticulate (and the stronger ones often slightly clavellate) at the apex.—Herbs, with sessile or decurrent alternate leaves, which are often pinnatifid; the margins and teeth usually spinose. Heads subglobose. Corolla purple, reddish, or ochroleucous.—*Thistle.*

§ 1. *Scales of the involucre more or less unequal, all but the innermost terminating in subulate and spinose spreading appendages: leaves decurrent.* (Eriolepis, *Cass.*)

1. *C. lanceolatum* (Scop.): stem branching, somewhat hairy; leaves decurrent on the stem and forming a spinose lobed wing, pinnatifid, rough and bristly above, somewhat glabrous or arenose-woolly beneath; the lobes and teeth tipped with spines and with spinulose margins; involucre ovoid, nearly bractless, arachnoid; the scales linear-lanceolate, tipped with spines, the exterior spreading; flowers purple. *DC.! prodr.* 6. *p.* 636.—Carduus lanceolatus, *Linn.*; *Engl. bot. t.* 107; *Fl. Dan. t.* 1173; *Hook.! fl. Bor.-Am.* 1. *p.* 302; *Darlingt.! fl. Cest. p.* 436. Cnicus lanceolatus, *Willd.*; *Pursh, fl.* 2. *p.* 506; *Bigel. fl. Bost. ed.* 2. *p.* 292.

Pastures and road-sides throughout the Northern and Middle States! introduced from Europe. Also Newfoundland, (*Hook.*, *DC.*) June–Sept.—② *Common Thistle.*

§ 2. *Scales of the ovoid or globose involucre either mucronate or tipped with a prickle; the innermost always unarmed: filaments hairy.* (Onotrophe, Cass.)

* *Scales of the involucre closely appressed and regularly imbricated in numerous series, the outermost very short, the others successively elongated, all but the innermost tipped with a spreading or recurved acicular prickle* (*leaves not decurrent, canescently tomentose beneath*).

2. *C. Pitcheri:* canescently tomentose throughout; stem stout, very leafy, simple or sparingly branched; leaves all pinnately parted, rigid; the segments narrowly linear, elongated, with revolute margins, terminated with small prickles, entire, or sparingly and remotely pinnately parted; heads usually several, racemose-spicate in the axils of the upper leaves; scales of the globose involucre oblong-lanceolate, acuminate, with arachnoid margins, appressed, tipped with a small spreading prickle; flowers ochroleucous.—Cnicus Pitcheri, *Torr. in Eaton, man. ed.* 5. *p.* 180.

On the sand banks of Lake Superior, Lake Huron, &c. *Dr. Pitcher!* Shore of Lake Michigan, *Dr. Wright!* June–July.—2? A foot or more high. Lower leaves 6–8 inches long, with a rigid narrowly margined rachis, which is naked at the base; the segments numerous, 1–4 inches long, 1–2 lines wide. Heads an inch in diameter, terminal, and on very short leafy branches in the axils of the upper leaves. Corolla nearly regular. Filaments somewhat pubescent. The longer bristles of the plumose pappus obscurely thickened at the summit.

3. *C. undulatum* (Spreng.): canescently tomentose throughout; stem low, angled, often branched above; the branches leafy, bearing solitary (pretty large) heads; leaves lanceolate-oblong, partly clasping, sinuate-pinnatifid, plicate-undulate, very white and tomentose beneath; the lobes often incised or 2-cleft, spinose; scales of the subglobose involucre lanceolate, appressed; the exterior tipped with a small and weak spreading prickle; the inner with attenuated membranous tips; flowers reddish-purple.—*DC. prodr.* 6. *p.* 651. C. Douglasii, *DC. prodr.* 6. *p.* 643; *Nutt.! in trans. Amer. phil. soc. l. c. p.* 419. Carduus undulatus, *Nutt.! gen.* 2. *p.* 130.

β. smaller and more slender; leaves more spinose and deeply pinnatifid.

Calcareous Islands of Lake Huron, and Upper Missouri, *Nuttall!* Hills of the Missouri near Fort Pierre, *Mr. Nicollet!* (α. & β.) Oregon, *Douglas* (probably not California, as given by De Candolle), *Nuttall!* June–July.—

②? Plant 1–2 feet high. Radical leaves sinuate and less spinose. Scales of the involucre at length almost glabrous, often glutinous along the midrib.

4. *C. Hookerianum* (Nutt.): arachnoid-tomentose throughout; stem simple or sparingly branched at the summit; striate; leaves lanceolate or linear, sinuate-pinnatifid, with the lobes often toothed or incised, spinulose, arachnoid above, canescently tomentose beneath; the cauline somewhat clasping; heads (rather small) 2–5, subsessile; scales of the subglobose very woolly involucre lanceolate, erect, tipped with somewhat spreading prickles; the innermost unarmed; flowers apparently purple.—*Nutt.! in trans. Amer. phil. soc. l. c. p.* 418. Carduus discolor (in part), *Hook.! fl. Bor.-Am.* 1. *p.* 302.

Saskatchawan or Rocky Mountains? (*Richardson* or *Drummond.*)—Plant 12–16 inches high, slender: doubtless distinct from C. discolor; but the specimens are not very complete. The stronger bristles of the pappus are somewhat more evidently clavellate or thickened at the apex than in most other species.

5. *C. discolor* (Spreng.): stem striate, hirsute, with leafy somewhat spreading branches; leaves all deeply pinnatifid, sessile, sparsely hairy and green above, densely tomentose-canescent (bluish-white) beneath; the segments divaricate, mostly 2–3-lobed, lanceolate or linear-lanceolate, spinulose-ciliate, and tipped with an acicular prickle; scales of the globose involucre somewhat arachnoid, appressed; the exterior ovate and tipped with a very slender spreading acicular prickle; the innermost linear-lanceolate; flowers reddish-purple.—*Spreng. syst.* 3. *p.* 373; *DC. prodr.* 6. *p.* 640. Cnicus discolor, *Muhl.! in Willd. spec.* 3. *p.* 1670; *Ell. sk.* 2. *p.* 271; *Bigel. fl. Bost. ed.* 2. *p.* 292. Carduus discolor, *Nutt. gen.* 2. *p.* 130; *Darlingt.! fl. Cest. p.* 437. Serratula discolor, *Poir.*

Fields and along thickets, (Canada?) Northern and New England States! to Illinois! Kentucky! and the upper districts of S. Carolina. July–Sept. —② Stem 3–6 feet high; the rather slender branches leafy to the summit, and terminated by heads an inch or more in diameter. Leaves of the branchlets quite small; the lower cauline 6–12 inches long (the white persistent tomentum very closely appressed); the segments mostly long and narrow, often falcate.

6. *C. altissimum* (Spreng.): stem tall, pubescent or somewhat woolly, branching; the branches leafy to the summit; leaves roughish-pubescent above, densely tomentose-canescent beneath, spinulose-ciliate; the radical petioled, pinnatifid; the cauline sessile, oblong-lanceolate, either undivided, sinuate-toothed, or sinuate-pinnatifid; the lobes or teeth spinescent; heads (rather large) bracteate; scales of the globose-ovoid involucre arachnoid when young, appressed; the exterior ovate-lanceolate, tipped with a spreading acicular prickle; the innermost narrow, with scarious acuminate tips; flowers mostly purple.—*DC.! prodr.* 6. *p.* 640, *& not.* 8. *pl. rar. Genev. p.* 5. C. altissimum, laciniato folio, &c., *Dill. Elth.* 1. *p.* 81, *t.* 69. C. diversifolium, *DC.! prodr. l. c. p.* 649. Carduus altissimus, *Linn. spec.* 2. *p.* 824; *Nutt. gen.* 2. *p.* 129; *Darlingt. fl. Cest. p.* 439. Cnicus altissimus, *Willd. spec.* 3. *p.* 1671; *Ell. sk.* 2. *p.* 268.

Fields and thickets, Pennsylvania! and Ohio! to Western Missouri! Louisiana! Alabama! Carolina! &c. Aug.–Sept.—4? Stem 3–10 feet high. Leaves quite variable in outline; sometimes the radical undivided: when the cauline are pinnatifid, the lobes are usually few and short, oblong or triangular. Scales of the involucre with a livid line or spot near the apex, which is often somewhat glutinous. Heads about an inch in diameter.

7. *C. Virginianum* (Michx.): stem slender, simple or loosely branched above, arachnoid; the branches or peduncles nearly naked; leaves sessile,

lanceolate or linear-lanceolate, green and glabrous above (or sparingly pubescent when young), tomentose-canescent beneath, with spinulose-ciliate (at length revolute) margins, either entire, repandly spinulose-toothed, or sparingly sinuate-lobed; the radical petioled, often sinuate-pinnatifid; heads small, not bracteate; scales of the subglobose involucre somewhat arachnoid when young, with a glutinous keel near the apex, appressed; the exterior ovate and lanceolate, tipped with a short cuspidate spreading prickle; the innermost attenuate, unarmed; flowers purple.—*Michx.! fl.* 2. *p.* 90; *DC. prodr.* 6. *p.* 653. Carduus Virginianus, *Linn.*; *Jacq. obs.* 4. *t.* 99; *Nutt.! l. c.* Cnicus Virginianus, *Pursh, fl.* 2. *p.* 506; *Ell. sk.* 2. *p.* 270.

β. lower cauline and radical leaves all deeply sinuate-pinnatifid, with the segments often 2–3-lobed; the upper very small, linear, entire.

γ. stem more leafy, much branched and paniculate above; leaves mostly pinnatifid and more spinescent.—Cnicus arvensis, *Hook.! in compan. to bot. mag.* 1. *p.* 48.

δ. ? stem stouter, sparingly branched, leafy; leaves all deeply pinnatifid, with the lobes spinescent; heads larger (roots often tuberiferous).—C. filipendulum, *Engelm.! mss.*

Pine woods, &c., Virginia to Georgia! Alabama! and Kentucky! *β.* & *γ.* Louisiana! Ohio! &c. *δ.* Texas, *Drummond! Dr. Lindheimer!* April–Sept.—♃ or ② ?—Stem 2–3 feet high. Heads about half an inch in diameter, smaller than in any of our species except C. arvense. In var. *δ.* ? which is not unlikely either a distinct species or a variety of C. altissimum, the heads are nearly as large as in the latter.

* * *Scales of the involucre appressed, regularly imbricated in several unequal series, unarmed, mucronate, or the exterior cuspidate with a short erect prickle: heads naked, or merely bracteate at the base.*

8. *C. muticum* (Michx.): stem tall, striate-angled, somewhat glabrous, paniculate at the summit; the branches sparingly leafy, bearing 1–few heads; leaves sessile, sparsely hairy above, arachnoid-tomentose beneath, when old often nearly glabrous, deeply pinnatifid; the segments lanceolate, sparingly lobed or incised, acute, pointed with spines, the margins ciliate-spinulose; scales of the subglobose involucre villous-arachnoid and somewhat viscid, appressed, unarmed; the exterior ovate or ovate-lanceolate, often mucronate; the innermost elongated, linear-lanceolate, acute; flowers purple.—*Michx.! fl.* 2. *p.* 89; *DC.! prodr.* 6. *p.* 652. C. Bigelowii, *DC. l. c.* Carduus muticus, *Nutt.*; *Hook. fl. Bor.-Am.* 1. *p.* 302; *Darlingt.! fl. Cest. p.* 438. Cnicus muticus, *Pursh, l. c.*; *Ell. sk.* 2. *p.* 268. C. glutinosus, *Bigel.! fl. Bost. ed.* 2. *p.* 291, not of *Lam.*

β. leaves often glabrous or nearly so, more rigid and spinescent; the segments linear-lanceolate.—Carduus glaber, *Nutt. gen.* 2. *p.* 129. Cnicus glaber, *Ell. sk.* 2. *p.* 270? Cirsium Nuttallii, *DC. prodr.* 6. *p.* 651?

Low shaded grounds and swamps, Canada! and Saskatchawan! to Louisiana! and Texas! the var. *β.* (which is not very distinct) growing in more exposed places, and prevailing in the Southern and Southwestern States! Aug.–Sept.—♃ or ②? Stem 3–8 feet high. Margins of the leaves strongly ciliate-spinulose when the plant grows in exposed places; the ciliate prickles weak and bristly when in deep shade. Heads half an inch to an inch in diameter; the dense cobwebby hairs which clothe the involucre partly disappearing with age. Marginal flowers sometimes with the stamens sterile, and the pappus sparingly or not at all plumose.

9. *C. Lecontei:* stem simple, slender, angled, naked at the summit and terminated by a single (rather large) head; leaves linear-lanceolate, acute, spinulose-ciliolate, sparingly toothed, the teeth spinose, glabrous above,

clothed beneath like the stem with a white and floccose somewhat deciduous wool, more or less decurrent; the lowest narrowed at the base into a kind of petiole; scales of the ovoid involucre appressed, somewhat arachnoid when young, glandular-carinate towards the apex; the exterior ovate and lanceolate, cuspidate-mucronate; the innermost elongated, linear-lanceolate, subulate-acuminate.—Cnicus Virginianus, *Hook.! in compan. to bot. mag.* 1. *p.* 48, not of authors.

Pine woods? Georgia, *Le Conte!* Covington, Louisiana, *Drummond!*—2f ? Stem about 2 feet high, perfectly simple. Lower leaves 6–8 inches long, half an inch wide, irregularly beset with spinose teeth; the margin not revolute. Heads much larger than in C. Virginianum, and nearly or quite equal to C. muticum: exterior scales of the involucre very short, the inner an inch or more in length, very slender; the short points straight. Flowers ochroleucous?

10. *C. repandum* (Michx.): arachnoid-woolly when young; stem low, simple, very leafy to the summit, bearing one or two heads; leaves crowded, oblong-linear, clasping, the margins undulate or repand-sinuate, thickly beset with small prickles; exterior scales of the involucre ovate-lanceolate and somewhat awned; the inner elongated and attenuate-acuminate; flowers purple.—*Michx.! fl.* 2. *p.* 89; *DC. prodr.* 6. *p.* 651. Carduus repandus, *Pers. syn.* 2. *p.* 386. C. Virginianus, *Walt. Car. p.* 195? Cnicus repandus, *Ell. sk.* 2. *p.* 269.

Dry pine barrens, &c., North Carolina! to Georgia! June–July.—2f ? Stem 1–2 feet high. Leaves 2–4 inches long, scarcely half an inch wide; the lowest tapering at the base. Heads middle-sized. Filaments slightly hairy towards the base.

11. *C. Drummondii:* dwarf, subcaulescent, sparsely hairy; stem (2–5 inches high) shorter than the leaves, bearing 1–3 large heads; leaves lanceolate, pinnatifid, green on both sides, ciliate-spinulose, the somewhat incised lobes spinose; scales of the subglobose naked involucre ovate and ovate-lanceolate, acuminate, appressed; the exterior mucronate or slightly spinose, the innermost with scarious and erose somewhat dilated tips; pappus of the marginal flowers slightly plumose near the base, or only denticulate! (flowers red).—Carduus pumilus, *Hook.! fl. Bor.-Am.* 1. *p.* 302, excl. syn.

Banks of the Saskatchawan and prairies of the Rocky Mountains, *Drummond!*—Heads rather smaller than those of C. pumilum; the scales of the involucre broader, smoother, and almost unarmed. Leaves chiefly radical, sparsely pubescent on both sides.

12. *C. pumilum* (Spreng.): stem low, stout, striate, hairy or villous, bearing 1–3 very large heads; leaves lanceolate-oblong, partly clasping, green on both sides, more or less villous, especially on the midrib beneath, pinnatifid, with spinulose margins; the segments short, incised or lobed, very spinose; involucre ovoid-globose, 1–5-bracteate; the exterior scales ovate-lanceolate, appressed, acuminate and tipped with a short spine; the innermost lanceolate-linear, with acuminate scarious tips; flowers reddish-purple.—*DC. prodr.* 6. *p.* 651. Carduus odoratus, *Muhl. cat. p.* 70; *Darlingt.! fl. Cest. ed.* 1. *p.* 85. C. pumilus (& var. Hystrix), *Nutt.! gen.* 2. *p.* 130; *Darlingt.! fl. Cest. ed.* 2. *p.* 437. Cnicus pumilus, *Torr.! compend. p.* 282; *Bigel. fl. Bost. ed.* 2. *p.* 292.

Dry fields and borders of swamps, Massachusetts to New York near the coast! New Jersey! and Pennsylvania! July.—② Stem 1–2 (rarely 3–4) feet high. Heads usually larger than in any other N. American species, often somewhat involucrate with a few spinose bracts. Involucre somewhat arachnoid. Corolla about 2 inches long. Flowers fragrant, sometimes pure

white (*Mr. Oakes*).—Muhlenberg's name is the most appropriate, and should have been preserved.—*Pasture Thistle.*

* * * *Scales of the involucre rather loosely imbricated in few series, tapering to a subulate point: heads conspicuously involucrate with a whorl of very spinose bracts!*

13. *C. horridulum* (Michx.): arachnoid-woolly when young, at length somewhat glabrous; stem simple or sparingly branched; leaves partly clasping, lanceolate, pinnatifid, the short lobes toothed or incised, strongly spinose; heads (large) surrounded by a whorl or dense cluster of pectinate-spinose bracts about the length of the involucre, the prickles often fascicled; scales of the subglobose involucre linear-lanceolate minutely scabrous and ciliate, tapering to a very sharp point, unarmed; flowers pale yellow.—*Michx.! fl.* 2. *p.* 90; *DC.! prodr.* 6. *p.* 651. C. megacanthum, *Nutt.! in trans. Amer. phil. soc. l. c.* Carduus horridulus, *Pers. syn.* 2. *p.* 390. C. spinosissimus, *Walt.* Cnicus horridulus, *Pursh, fl.* 2. *p.* 507; *Bigel.! fl. Bost. ed.* 2. *p.* 291; *Hook.! compan. to bot. mag.* 1. *p.* 48. C. spinosissimus, *Darlingt.! fl. Cest. p.* 438.—Varies, with the anthers and styles reddish or purple (*Bigel. l. c. Oakes, mss.*), or with the corolla sometimes changing to purple in drying (*Barratt, mss.*), or

β. Elliottii: flowers purple.—Cnicus horridulus, *Ell. sk.* 2. *p.* 272.

Hills and poor soils, from the coast of Massachusetts! and Connecticut! to Florida! and Louisiana! *β.* Southern States, *Elliott.* Florida, *Dr. Chapman!* (Corolla in dried specimen light purple, the anthers yellowish.) Lincoln County, N. Carolina, *Mr. Curtis! Dr. Hunter!* (Corolla, anthers, and style deeply purple.) June–Aug. in the Northern, March–May in the Southern States.—♃ or ②? Plant 1–3 feet high; the large heads subtended by 12–30 very spinose bracts; the exterior often pinnatifid.—A somewhat variable, but well-marked species, with the corolla and pappus much larger than in C. spinosissimum, the heads not clustered, and the lobes of the leaves rather distant. From the characters given, we suspect it is equally distinct from C. glabrum, *DC.*, of which we possess no specimen.—*Yellow Thistle.*

* * * * *Scales of the involucre loosely imbricated in few series, somewhat unequal in length; the exterior with subulate-spinescent tips: heads not involucrate with bracts.*

14. *C. remotifolium* (DC. l. c.): stem tall, erect, striate, branching and nearly naked above, somewhat arachnoid and hairy; leaves remote, lanceolate, sparsely hairy above, arachnoid-tomentose beneath, partly clasping by an auriculate very spinose base, pinnately parted; the segments deeply 2–3-cleft; the lobes lanceolate, tipped with a spine, the margins somewhat spinulose; heads large, paniculate; the panicle nearly leafless; scales of the involucre somewhat arachnoid, nearly equal, straight, lanceolate-subulate, loose, cuspidate; the innermost membranaceous, much acuminated, unarmed; "flowers purplish."—Carduus remotifolius, *Hook. fl. Bor.-Am.* 1. *p.* 302. Cirsium stenolepidum, *Nutt.! in trans. Amer. phil. soc. l. c. p.* 419.

Plains of Oregon, *Douglas, Nuttall!*—Stem purple above, 3–5 feet high. Leaves somewhat resembling those of C. discolor. Heads as large as in C. lanceolatum.

§ 3. *Heads by abortion diœcious: exterior scales of the involucre appressed, unarmed, or the outermost tipped with a short prickle or bristle; the innermost with scarious tips: filaments nearly glabrous: roots creeping.* (Cephanoplos, *DC.*)

15. *C. arvense* (Scop.): rhizoma creeping; stem striate-angled, panicu-

late; the branches somewhat woolly: leaves oblong or lanceolate, sessile, glabrous, sometimes a little woolly beneath, sinuate-pinnatifid, undulate, spinose; heads small and numerous; scales of the involucre ovate-lanceolate, mucronate, a few of the exterior cuspidate-spinose; flowers pale purple, or rarely whitish.—*DC.! prodr.* 6. *p.* 643. Serratula arvensis, *Linn.*; *Fl. Dan. t.* 644. Carduus arvensis, *Smith, Engl. bot. t.* 975; *Hook.! fl. Bor.-Am.* 1. *p.* 301; *Darlingt.! fl. Cest. p.* 439. Cnicus arvensis, *Pursh, fl.* 2. *p.* 506; *Bigel. fl. Bost. ed.* 2. *p.* 291. Breea arvensis, *Less. syn. p.* 9.

Cultivated fields of the Northern and Middle States! introduced with grain from Europe, and in many places becoming an extremely troublesome weed. Also Canada! to Saskatchawan and Newfoundland; probably indigenous. July–Aug.— 2f Too well known to our farmers, under the name of *Canada Thistle*, or *Cursed Thistle*.

‡ *Little-known species.*

16. *C. foliosum* (DC. l. c.): stem erect (simple?), robust, striate, somewhat woolly; leaves erect, the upper very numerous and exceeding the heads, flaccid, irregularly sinuate-toothed, unequally ciliate with rather rigid spines, sparingly hairy above, pale and arachnoid-tomentose beneath; heads large, glomerate in the axils of the uppermost leaves; scales of the involucre linear, appressed; pappus very copious. *Hook.*—Carduus foliosus, *Hook. fl. Bor.-Am.* 1. *p.* 303.

Prairies of the [Northern] Rocky Mountains, *Drummond.*—"The stems are singularly erect and straight; the leaves also erect, 6–8 inches long, the uppermost very numerous, considerably exceeding and almost concealing the flowers." *Hook.*

17. *C. edule* (Nutt.): annual or biennial, nearly smooth; leaves lanceolate, clasping, moderately pinnatifid; the segments obtuse, almost equally 2-lobed, spinescent and spinulose-ciliate; heads terminal, glomerate, sessile, 3–5 together; involucre subglobose, arachnoid-tomentose; the scales linear-lanceolate, tipped with short erect spines. *Nutt. in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 420.

Common in the plains of the Oregon and the Blue Mountains, *Nuttall.*—A robust plant 3–4 feet high, somewhat succulent, with purple flowers, nearly as large as in C. lanceolatum. Filaments hairy. The young stems are eaten raw by the aborigines. *Nutt.*—Probably the same as the C. foliosum, *Hook.* An edible thistle is mentioned by Lewis and Clarke.

18. *C. brevifolium* (Nutt.): stem slender, nearly terete, and as well as the lower surface of the leaves canescently tomentose, bearing 2–3 heads; leaves oblong-lanceolate, clasping, green and nearly glabrous above, sinuate-pinnatifid, with shallow simple or 2-cleft lobes, tipped with spines, and with spinose serratures; involucre ovate, naked; the scales lanceolate, glutinous, smooth, terminating in small erect spines; flowers ochroleucous. *Nutt. in trans. Amer. phil. soc. l. c. p.* 421.

Plains of the Rocky Mountains, *Nuttall.*—Leaves about half an inch wide, 2–3 inches long. Allied to C. Virginianum. *Nutt.*

19. *C. canescens* (Nutt.): perennial, dwarf, slender, canescently tomentose; leaves lanceolate, decurrent, pinnatifid; the undulate segments oblong, 2-cleft, spinescent, and with spiny serratures; heads few (3–5), conglomerate, sessile; involucre slightly pubescent; the scales lanceolate, with rigid erect spines. *Nutt. in trans. Amer. phil. soc. l. c. p.* 420.

Arid deserts of the Platte, *Nuttall.*—Root creeping as in C. arvense. Stem 8–10 inches high. Leaves 3–4 inches long, about an inch wide, nearly white on both sides, but most so beneath, decurrent with narrow spiny

margins. Flowers pale rose-color. *Nutt.*—Not improbably our C. undulatum, var. *β*.

172. CARDUUS. *Tourn.*; *Linn.* (excl. spec.); *Gærtn. fr. t.* 162; *DC. l. c.*

Bristles of the pappus scabrous (not plumose) : otherwise as in Cirsium.

§ *Bristles of the pappus few and slender*—LEPTOCHÆTA, *Nutt.*

1. *C. occidentalis* (Nutt.): perennial, dwarf; leaves deeply pinnatifid, nearly smooth above, canescently tomentose beneath; the segments somewhat palmate; the ultimate lobes lanceolate, tipped with short spines, spinulose-serrulate; scales of the subglobose arachnoid-tomentose involucre lanceolate, erect, terminating in straight spines; the innermost scarious, spineless, acuminate. *Nutt. in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 418.

St. Barbara, California, *Nuttall.*—Stem tomentose, 6–12 inches high. Leaves 4–5 inches long, about an inch wide, with a lanceolate outline; the cauline clasping. Heads 2–3, subsessile, pale purple. Plant with the habit of Cirsium discolor, *Nutt.*—We have not seen this plant, the only one of the genus known to inhabit this continent. May it not be some species of Southern Europe, introduced into California?

C. pectinatus (Linn. mant.), a plant of uncertain origin, said to have been raised from seeds received from Pennsylvania, is doubtless not a native of this country, and is probably correctly referred by Sprengel to Carduus defloratus.

173. ONOPORDON. *Vaill.*; *Linn.*; *Gærtn. fr. t.* 161; *Schkuhr, handb. t.* 230.

Heads many-flowered; the flowers perfect. Scales of the ovate-globose involucre imbricated, coriaceous, tipped with a lanceolate spinescent appendage. Receptacle fleshy, deeply alveolate; the alveoli membranaceous, sinuate-toothed. Tube of the corolla incrassated at the summit. Anthers with a linear-subulate appendage, and with short tails: filaments nearly glabrous. Branches of the style concreted nearly to the apex. Achenia obovoid-compressed, 4-angled, rugose transversely. Bristles of the pappus numerous, filiform, barbellulate, united at the base into a corneous ring.—Coarse branching herbs; the stems winged by the decurrent base of the lobed or toothed leaves; the lobes and teeth spinescent. Corolla purple, rarely varying to white.

1. *O. acanthium* (Linn.) : stem erect, branching, somewhat woolly; leaves decurrent, sinuate, spinose-toothed, tomentose on both sides; scales of the involucre linear-subulate; the exterior spreading, woolly at the base. *DC.*—*Engl. bot. t.* 977; *Bigel. fl. Bost. ed.* 2. *p.* 293; *DC. prodr.* 6. *p.* 618.

Waste grounds and dry pastures; introduced from Europe, and naturalized in the New England States! July–Aug.— ② A tall cottony plant, called *Cotton Thistle.*

174. LAPPA. *Tourn. inst. t.* 156; *Juss.*; *Lam. ill. t.* 665; *DC.*

Heads many-flowered; the flowers all perfect and similar. Involucre globose; the imbricated scales coriaceous and appressed at the base, then

subulate and spreading, with the rigid apex uncinate. Receptacle flat, somewhat fleshy, setose-fimbrillate. Corolla regularly 5-cleft, 10-nerved. Anthers tipped with filiform appendages, caudate at the base: filaments papillose. Branches of the style free and divergent at the apex. Achenia oblong, compressed, glabrous, rugose transversely. Pappus of numerous short filiform scabrous bristles, not united into a ring, caducous.—Biennial branching coarse (European) herbs; with large cordate and petioled leaves with slightly undulate margins, the lower surface more or less tomentose. Heads small, solitary or somewhat corymbose. Corolla purple varying to white, equalling the involucre.—*Burdock.*

1. *L. major* (Gærtn.): scales of the involucre all subulate and with uncinate tips, either glabrous or loosely arachnoid; upper cauline leaves ovate; the others (large) cordate.—*Gærtn. fr.* 2. *p.* 379, *t.* 162. L. major & L. minor, *DC. prodr.* 6. *p.* 661. Arctium Lappa, *Linn.; Darlingt. fl. Cest. p.* 436.

Fence-rows and waste-places in rich soil: introduced from Europe.—A troublesome weed, well known under the name of *Burdock.* Dr. Darlington and Mr. Tuckerman have observed an occasional form, (L. Bardana ?) with pinnatifid leaves.

SUBORDER II. LABIATIFLORÆ. *DC.*

Corolla of the perfect flowers bilabiate; the outer lip mostly 3-lobed or 3-toothed, and the inner 2-cleft or 2-toothed. Pollen smooth, globose or elliptical.

TRIBE VI. MUTISIACEÆ. *Less.*

Heads heterogamous, or rarely dicœcious; the marginal flowers pistillate or neutral, either ligulate or bilabiate.—Style nearly as in the Cynareæ.

175. CHAPTALIA. *Vent. hort. Cels. t.* 61; *DC. in ann. mus.* 16. *p.* 66.

Heads many-flowered, heterogamous, radiate; the rays pistillate and fertile, in 2 series; the disk-flowers perfect, but sterile by the abortion of the ovary. Corolla of the outer series of ray-flowers simply ligulate, or rarely with a minute inner lip; of the inner series filiform and much shorter than the style, obliquely truncate, the inner lip rudimentary; of the disk-flowers bilabiate, the lips equal in length, the outer 3-toothed, the inner 2-parted. Scales of the campanulate involucre imbricated in few series, linear, acute, 1-nerved. Receptacle naked. Anthers caudate. Achenia of the fertile flowers oblong, glabrous, striate, attenuate at each end, somewhat beaked, and with the apex slightly dilated; of the disk-flowers abortive. Pappus copious, capillary, minutely scabrous.—Perennial acaulescent (American)

herbs, with naked scapes bearing solitary heads; the leaves all radical, tomentose beneath. Flowers white or purplish.

1. *C. tomentosa* (Vent. l. c.): leaves oblong or nearly lanceolate, somewhat petioled, retrorsely denticulate; the lower surface and the slender scape densely tomentose with a white matted wool; the upper arachnoid when young, at length glabrous; head nodding when in flower; exterior rays 16–20, simply ligulate.—*Pursh! fl.* 2. *p.* 577; *Bot. mag. t.* 2257; *Ell. sk.* 2. *p.* 459; *DC.! prodr.* 7. *p.* 41. Perdicium semifloscularе, *Walt.! Car. p.* 204. Tussilago integrifolia, *Willd.! spec.* 3. *p.* 1964; *Michx.! fl.* 2. *p.* 121.

Damp pine barrens, &c. North Carolina! to Florida! and Louisiana! March–May. Scape a span to a foot high.

Tribe VII. NASSAUVIACEÆ. *Less.*

Heads homogamous, radiatiform; the flowers all similar and perfect. Style nearly as in the Senecioneæ.

176. ACOURTIA. *Don, in trans. Linn. soc.* 16. *p.* 203; *DC. prodr. p.* 65.

Heads 10–30-flowered, discoid, homogamous; the flowers perfect. Involucre turbinate; the scales imbricated in several series, lanceolate, appressed, dilated at the base, articulated with the rachis, deciduous! Receptacle naked. Corolla of all the flowers bilabiate; the outer lip ligulate and 3-toothed; the inner 2-parted, with the revolute lobes linear and obtuse. Anthers tipped with a linear-lanceolate cartilaginous appendage; the tails simple and obtuse. Branches of the style truncate, papillose at the apex. Achenia nearly terete, elongated, papillose-scabrous. Pappus a single series of bristles, penicillate at the apex, deciduous.—Shrubby (Mexican and Californian) branching glaucous plants, with the habit of Serratula. Leaves cordate-clasping, with the auricles free, spinulose-serrate. Heads 3–10, fasciculate-corymbose: scales of the involucre often reddish, ciliate. Corolla purple or rose-color; pappus white. *DC.*

1. *A. microcephala* (DC.): stem herbaceous? branching; the branches angular, somewhat velvety with a glandular pubescence; leaves cordate-clasping, ovate, acute, sharply toothed, glandular, somewhat puberulent beneath; heads several in a thyrsoid corymb; scales of the involucre mucronate-acuminate, glandular-puberulent on the back. *DC. l. c.*

California, *Douglas.*—This and the Chaptalia are the only North American representatives of a suborder, which is eminently characteristic of the western portion of South America.

Suborder III. LIGULIFLORÆ. *DC.*

Flowers all ligulate and perfect, disposed in a homogamous radiatiform head. Pollen scabrous and many-sided, usually dodecahedral.

TRIBE VIII. CICHORACEÆ. *Vaill., Juss.*

Style cylindraceous above, the summit as well as the rather obtuse branches uniformly pubescent; the stigmatic lines terminating below or near the middle of the branches.—Plants with a milky juice! Leaves alternate.

CONSPECTUS OF THE GENERA.

466 Subtribe 1. LAMPSANEÆ.—Pappus none. Receptacle not chaffy.

177. LAMPSANA. Achenia obscurely striate. Involucre erect. Heads paniculate.
178. APOGON. Achenia many-ribbed. Involucre connivent in fruit. Heads solitary or umbellate. Cauline leaves often opposite.

Subtribe 2. HYOSERIDEÆ.—Pappus either wholly or partly chaffy or squamellate. Receptacle not chaffy. 467

* *Involucre simple, equal, scarcely in 2 series.*

179. KRIGIA. Pappus of 5 broad chaffy scales and 5 alternate bristles.
180. CYNTHIA. Pappus of numerous short squamellæ and capillary bristles.

* * *Involucre double or imbricated.*

181. SCORZONELLA. Pappus of 10 short chaffy scales, bearing long capillary awns.
182. CALAIS. Pappus of 5 elongated and scarious (often bifid) awned scales.
183. CICHORIUM. Pappus very small, multi-squamellate. Flowers blue!

Subtribe 3. SCORZONEREÆ.—Pappus setose, or plumose. Receptacle not chaffy. 472

184. STEPHANOMERIA. Achenia truncate. Pappus plumose. Heads 3–6-flowered.
185. RAFINESQUIA. Achenia rostrate. Pappus plumose. Heads many-flowered.
186. LEONTODON. Achenia fusiform or slightly rostrate. Pappus plumose. Heads many-flowered.

Subtribe 4. LACTUCEÆ.—Pappus capillary, not plumose. Receptacle not chaffy. 474

* *Pappus dirty white or tawny, fragile. Achenia not rostrate.*

187. APARGIDIUM. Pappus barbellate, in a single series. Heads many-flowered.
188. HIERACIUM. Pappus scabrous, in a single series. Heads 20–many-flowered (yellow). Achenia oblong or columnar.
189. NABALUS. Pappus scabrous, copious. Heads 5–30-flowered (ochroleucous, whitish, or purplish), nodding. Achenia linear-oblong, cylindrical.
190. LYGODESMIA. Pappus scarcely scabrous, very copious. Heads 5–10-flowered (rose-purple), erect. Achenia linear, elongated.

* * *Pappus bright white* (*except in* Pyrrhopappus *and a single* Mulgedium).

+ Achenia terete or angled, not evidently compressed nor rostrate.

191. MALACOTHRIX. Pappus in a single series, soft; the bristles sparingly barbellate near the base. Achenia short, truncate.

192. CREPIS. Pappus in two or more series, soft, slightly scabrous. Achenia columnar, fusiform, or obscurely pointed.

193. TROXIMON. Pappus copious and unequal, in several series, rigid. Achenia oblong-linear, scarcely or not at all rostrate. Acaulescent, simple.

+ + Achenia terete, ribbed or angled, with a long filiform beak.

194. MACRORHYNCHUS. Involucre imbricated. Achenia with about 10 ribs or callous wings, smooth. Acaulescent.

195. TARAXACUM. Involucre double, in 2 series. Achenia striate-angled, usually muricate. Acaulescent.

196. PYRRHOPAPPUS. Involucre double, in 2 series, the exterior of spreading subulate scales. Achenia scabrous. Caulescent or acaulescent. Pappus reddish or fulvous.

+ + + Achenia flattened, either compressed or obcompressed.

197. LACTUCA. Achenia obcompressed, flat, abruptly produced into a filiform beak. Pappus very soft and white.

198. MULGEDIUM. Achenia compressed, tapering into a short or thick (sometimes indistinct) beak. Pappus bright white or tawny. Flowers blue.

199. SONCHUS. Achenia compressed, not rostrate. Pappus exceedingly soft and delicate, bright white. Involucre becoming tumid at the base. Flowers yellow.

Subtribe 1. LAMPSANEÆ, *Less.*—Receptacle not chaffy. Pappus none.

177. LAMPSANA. *Tourn.; Juss. gen. p.* 168; *DC. prodr.* 7. *p.* 76.

Lapsana, *Linn.; Gærtn. fr. t.* 157.

Heads 8–12-flowered. Scales of the cylindrical-campanulate angled involucre 8, erect, in a single series, bracteolate with one or two minute scales. Receptacle narrow, naked. Achenia oblong, glabrous, obscurely striate, caducous, destitute of pappus.—Slender branching herbs (natives of the old world), with angulate or toothed leaves, and small loosely paniculate-corymbose heads. Flowers yellow.

1. *L. communis* (Linn.): annual, somewhat glabrous; lower leaves ovate, angulate-toothed, petioled, sometimes lyrate; involucre very glabrous, nearly equalling the flowers.—*Fl. Dan. t.* 500; *Engl. bot. t.* 844; *Schkuhr, handb. t.* 225; *Hook.! fl. Bor.-Am.* 1. *p.* 296.

Lower Canada, *Mrs. Sheppard! Mrs. Percival!* Probably introduced from Europe.—Mr. Oakes once found this plant by the roadside in Cambridge, Massachusetts.

178. APOGON. *Ell. sk.* 2. *p.* 267; *DC. prodr.* 7. *p.* 78.

Heads 10–20-flowered. Scales of the involucre mostly 8, somewhat in two series, ovate, acuminate, nearly as long as the corolla, connivent in fruit. Receptacle naked. Achenia obovoid-oblong, terete, longitudinally ribbed, and marked with very minute transverse striatures, glabrous. Pappus none!

(or sometimes very minute and chaffy. *DC.*)—An annual glabrous or somewhat glaucous small herb, 4–12 inches high, branched from the base; the branches slender, erect or ascending, bearing 1–3 or several umbellate slender pedicels at the summit, and also frequently in the axils of the cauline leaves, mostly a little hispid near the summit, terminated by single small heads. Radical leaves obovate-oblong or lanceolate, entire or sparingly toothed, the primordial nearly sessile, the others tapering into petioles; cauline lanceolate, acute or acuminate, entire, sessile, partly clasping; the uppermost mostly opposite! Flowers yellow.

A. humilis (Ell.! l. c.)—A. humilis & A. gracilis, *DC.! l. c.*

β. lyrata: radical and lower cauline leaves (either some or all of them) variously lyrate-toothed or pinnatifid.—A. lyratum, *Nutt.! in jour. acad. Philad.* 7. *p.* 71, & *in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 424. Serinia cæspitosa, *Raf. fl. Ludov. p.* 149? (*DC. prodr.* 7. *p.* 261.)

South Carolina! Georgia! and Florida! to Louisiana! Arkansas! and Texas! *β.* Louisiana, *Drummond! Dr. Hale!* Plains of Arkansas, *Nuttall, Dr. Pitcher!* &c. Texas, *Drummond!* April–June.—We cannot discover the 'minute chaffy pappus' in an original specimen of A. gracilis, *DC.*, nor find any appreciable difference in the achenia. In both Elliott's and Nuttall's plants, also, the pedicels are frequently furnished with bristly hairs towards the summit; and the irregular incision of the leaves in the latter is very inconstant.

Subtribe 2. HYOSERIDEÆ, *Less.*—Receptacle not chaffy. Pappus simple or double, either wholly or partly chaffy, squamellate, or coroniform.

179. KRIGIA. *Schreb. gen. p.* 532; *Willd.*; *DC. prodr.* 7. *p.* 88.

Heads 15–30-flowered. Scales of the involucre 6–15, somewhat in a double series, equal. Receptacle naked. Achenia turbinate, many-striate, somewhat 5-angular. Pappus double; the exterior of 5 broad and rounded scarious chaffy scales; the inner (rarely wanting) of as many slender scabrous bristles alternating with the scales, and corresponding with the angles of the achenium.—Small annual (North American) herbs, branching from the base; the mostly lyrate or toothed leaves radical or nearly so; the naked branches or scapes long and slender, simple, terminated by solitary small heads. Flowers yellow.

§ 1. *Bristles of the pappus more or less exceeding the chaffy scales, but not longer than the terete achenium, sometimes entirely wanting: scales of the involucre* 5–8, *with a strong midrib, erect and carinate-navicular in fruit.*—CYMBIA.

1. *K. occidentalis* (Nutt.): scapes very numerous from the same root, diffuse, simple, leafless, hispid; leaves either entire or lyrate; the exterior with the lamina or terminal lobe oval or roundish; the innermost lanceolate or narrowly linear; achenia equally many-ribbed, ciliolate-scabrous on the ribs which correspond with the bristles of the inner pappus, very minutely

reticulate-rugose by transverse lines.—*Nutt.! in jour. acad. Philad.* 7. *p.* 104, & *in trans. Amer. phil. soc. l. c. p.* 427.

β. mutica: bristles of inner pappus altogether wanting!

Arkansas, *Nuttall! Dr. Leavenworth!* Texas, *Drummond!* (*a.* & *β.* under no. 164.)—Scarcely a span high. Earlier radical leaves in shape not unlike those of Cardamine bellidifolia, sometimes lyrate-pinnatifid with several divisions; the later ones much more slender. One of two of the involucral scales are usually 2–3-nerved, and 2–3-carinate in fruit.—Except as to the pappus, the var. *β.* is not distinguishable from the ordinary form.

§ 2. *Bristles of the pappus much longer than the pentangular achenium: scales of the involucre* 10–18, *linear-lanceolate, nearly nerveless, spreading in fruit.*—EUKRIGIA.

2. *K. Virginica* (Willd.): scapes at length several, sparsely and minutely pubescent, especially near the apex; leaves somewhat glaucous; the primary orbicular or spatulate, mostly entire; the succeeding spatulate-oblong or lanceolate, lyrate-toothed, or sinuate-pinnatifid.—*Willd. spec.* 3. *p.* 1618; *Nutt.! gen.* 2. *p.* 127; *Ell. sk.* 2. *p.* 264; *Bigel. fl. Bost. ed.* 2. *p.* 289; *Darlingt.! fl. Cest. p.* 440; *DC.! l. c.* Hyoseris Virginica, *Linn. spec.* 2. *p.* 809; *Lam. jour. hist. nat.* 1. *p.* 22, *t.* 12; *Michx.! fl.* 2. *p.* 88. Cynthia Virginica, *Beck, bot. p.* 169, not of *Don.*

β. dichotoma (Barton): more caulescent; stems much branched near the base.—K. dichotoma, *Nutt.! l. c.; DC.! l. c.* Hyoseris ramosissima, *Bart. prodr. fl. Philad.*

Dry sandy grounds and rocks (rarely in wet places), Canada! to Louisiana! and Texas! May–Aug.—Scapes 1–10 inches high. Flowers deep yellow. Achenia minutely hispid-scabrous on the angles.—The var. *β.* is a summer state of the species.—*Dwarf Dandelion.*

3. *K. Caroliniana* (Nutt.): scapes solitary or several, slightly and sparsely pubescent, often somewhat hispid at the summit; primary leaves linear-lanceolate, acute at each end, entire or with one or two divaricate lobes on each side; the succeeding variously pinnatifid, runcinate, or incised, acute or obtuse.—*Nutt.! l. c.; Ell. l. c.; DC.! l. c.* Hyoseris Caroliniana, *Walt. Car. p.* 194.

β. leptophylla: leaves all linear-lanceolate, acuminate, either entire or with one or two slender divaricate lobes on each side.—K. leptophylla, *DC.! l. c.*

Carolina! to Florida, Alabama! and Texas! Feb.–May.—Scapes 1–12 inches high. Leaves very variable as to size, incision, &c.

‡ *Uncertain species.*

4. *K. montana* (Nutt. l. c.): very glabrous, procumbent; leaves lanceolate [or somewhat spatulate], entire; pappus double; the exterior minute chaffy scales and the bristles few. *Michx.*—Hyoseris montana, *Michx. fl.* 2. *p.* 87.

On the highest mountains of North Carolina, *Michaux.*

180. CYNTHIA. *Don. in Edinb. phil. jour.* 12. *p.* 305; *Less.*; *DC.*

Heads many-flowered. Scales of the involucre 12–15, linear-lanceolate, equal, somewhat in a double series, shorter than the corolla. Receptacle flat, foveolate. Achenia short, obscurely quadrangular, many-striate, not

rostrate. Pappus double; the exterior of numerous very small chaffy squamellæ; the inner of numerous capillary and scabrous somewhat deciduous bristles.—Perennial nearly glabrous and somewhat glaucous (North American) herbs; with very smooth undivided or pinnatifid leaves: the scapes or peduncles slender, mostly glandular-hispid at the summit, and bearing single middle-sized heads. Flowers bright yellow.

§ 1. *Caulescent, somewhat branched above: root not tuberiferous: peduncles subumbellate: achenia oblong, slightly narrowed towards the base.*—EUCYNTHIA, DC. (excl. char. invol. calycul.) (Luthera, *Schultz.*)

1. *C. Virginica* (Don, l. c.): leaves oval, spatulate-oblong, or oblong-lanceolate; the radical on short winged petioles, angulate-denticulate, sinuate-toothed, somewhat lyrate, or occasionally deeply pinnatifid; the cauline 1–2, clasping, mostly entire; peduncles 2–5, elongated.—*DC.! l. c.*—C. amplexicaulis, *Beck! bot. p.* 168; *Darlingt.! fl. Cest. p.* 441. C. Griffithii, *Nutt.! in jour. acad. Philad.* 7. *p.* 69. Tragopogon Virginicum, *Linn. spec.* 2. *p.* 789. Hyoseris amplexicaulis, *Michx.! fl.* 2. *p.* 87. H. biflora, *Walt. Car. p.* 194. H. prenanthoides, *Willd. spec.* 3. *p.* 1516. Troximon Virginicum, *Pers. syn.* 2. *p.* 360; *Pursh, fl.* 2. *p.* 505. Krigia amplexicaulis, *Nutt.! gen.* 2. *p.* 127; *Ell. sk.* 2. *p.* 266. Luthera Virginica, *Schultz, in Linnæa*, 10. *p.* 257.

Dry or moist sandy soil, &c., New York! Michigan! and from Lake Winipeg (*Dr. Houghton!*) to Kentucky! and the upper part of Carolina! and Georgia! May–July.—Stem 1–2 feet high, sometimes once or twice forked, somewhat naked. Leaves 2–5 inches long. Peduncles subtended either by a single small bracteant leaf, or by 2 unequal and nearly opposite bracts. Achenia glabrous. Pappus strongly scabrous.—The state with pinnatifid or lyrate radical leaves not at all constant.

§ 2. *Acaulescent: roots tuberiferous: scapes naked, simple: achenia tapering to the base, somewhat turbinate.*—ADOPOGON, DC. (not of *Neck.?*)

2. *C. Dandelion* (DC.! l. c.): scapes usually several from the same root; primary leaves spatulate-oblong; the others linear-lanceolate, elongated, mostly acute, either entire, repand-denticulate, remotely sinuate-toothed, or laciniate-subpinnatifid; the triangular-lanceolate divaricate lobes 2–3 on each side.—C. Dandelion & C. Boscii, *DC.! l. c.* C. lyrata, *Nutt.! in jour. acad. Philad.* 7. *p.* 69. Tragopogon Dandelium, *Linn. spec. ed.* 2. *p.* 1111 (*pl. Gronov.!*); *Willd. l. c.* Troximon Dandelion, *Pers. l. c.* Hyoseris major, *Walt. l. c.* H. angustifolia, *Michx. fl.* 2. *p.* 87; *Pursh, l. c.* Krigia Dandelion, *Nutt.! gen.* 2. *p.* 127; *Ell. l. c.*

β. leaves very narrowly linear and attenuated, either entire or sparingly laciniate-pinnatifid.—Krigia Caroliniana, *Hook.! in compan. to bot. mag.* 1. *p.* 100, not of *Nutt.*

γ. often caulescent and decumbent; leaves either remotely sinuate-pinnatifid or entire; the upper cauline somewhat opposite.—Hyoseris montana, *Michx. fl.* 2. *p.* 87?

Low grounds and fields, Maryland! and Virginia! to Alabama! Louisiana! Arkansas! and Texas! *γ.* Wet rocks at Tulaloo Falls, and mountains of Georgia, *Mr. Buckley!* March–May.—Scapes 6–15 inches high: some of the leaves often almost as long. Roots fibrous, bearing small round tubers at the extremity. Achenia somewhat scabrous. Exterior squamellate pappus always present; the bristles of the inner minutely scabrous.—Our var. *β.*

which has remarkably narrow leaves, passes into the ordinary state, from which C. Boscii, *DC.* is in no way distinguishable. The var. γ. is a singular and probably local form.—The leaves in this and the preceding genera are exceedingly variable in their outline, division, &c., upon which no dependence can be placed for specific characters.

181. SCORZONELLA. *Nutt. in trans. Amer. phil. soc. (n. ser.)* 7 *p.* 426.

Head many-flowered. Scales of the cylindraceous-ovoid involucre imbricated in 3–4 series, ovate, conspicuously acuminate, membranaceo-chartaceous, nearly as long as the corolla. Receptacle flattish, alveolate. Achenia short, somewhat quadrangular, not attenuate at the apex, many- (10–14-) striate, smooth, obscurely pubescent or glabrous. Pappus of 10 (or rarely fewer) very small and coriaceous ovate chaffy scales, somewhat in two series, which are entire or obscurely denticulate at the apex, each tipped with a very long and capillary scabrous awn.—Perennial nearly glabrous herbs (natives of Oregon); with the habit of Scorzonera: the stems several from the same fusiform or tuberous root, sheathed below the membranous dilated bases of the (usually laciniately pinnately parted) leaves, simple or sparingly branched, naked above, and terminated by solitary heads. Corolla yellow.

The scales of the pappus are certainly distinct, not united at the base into a cup, as described by Nuttall.

1. *S. laciniata* (Nutt.! l. c.): slightly puberulent; leaves pinnately parted: the segments long and slender, linear-subfiliform; scales of the involucre imbricated in 3–4 series, all acuminated from a broad base; scales of the pappus ovate.—Hymenonema? laciniatum, *Hook.! fl. Bor.-Am.* 1. *p.* 301.

Plains of the Oregon, from the Rocky Mountains to the ocean, *Douglas!* &c. Near the mouth of the Wahlamet, *Nuttall!*—A foot high: the long naked peduncles fistulous. Flowers bright sulphur-yellow. The inconspicuous squamellate portion of the pappus several times shorter than the achenium; the bristles about twice the length of the achenium.

2. *S. leptosepala* (Nutt. l. c.): leaves pinnately parted; scales of the involucre in two series; the exterior about 5, ovate; the inner 8, lanceolate, acuminate; scales of the pappus oblong-lanceolate.

With the preceding, and scarcely distinguishable from it, except by the involucre, *Nuttall.*—This is entirely unknown to us.

3. *S. glauca* (Nutt. l. c.): leaves linear-acuminate, canaliculate, glaucous.—Hymenonema? glaucum, *Hook. l. c.*

Oregon, at Fort Vancouver, *Mr. Garry*, ex *Hook.*—This is a doubtful plant, only known by the brief character given by Hooker.

182. CALAIS. *DC. prodr.* 7. *p.* 85. (excl. syn.)

Uropappus, *Nutt.*

Head many-flowered. Involucre cylindraceous, double; the scales lanceolate, acuminate, membranaceous; the exterior 3–6 more or less calyculate;

the interior 8–12 somewhat in 2 series, rather longer than the flowers. Receptacle flat, naked. Achenia terete, slender, attenuate at the summit or rostrate, striate; the minute ribs scabrous. Pappus of 5 linear-lanceolate 1-nerved scarious scales (which are at length convolute around the corolla); the midrib produced into a minutely scabrous awn.—Annual nearly glabrous (Californian) herbs, simple or sparingly branched near the base; the scapiform stems mostly exceeding the linear and attenuated entire or sparingly pinnatifid leaves, naked and fistulous above, terminated by a single head. Corolla yellow.

§ 1. *Achenia scarcely rostrate; the exterior* (Nutt.) (*the inner, ex* Hook. & Arn.) *hirsute with appressed hairs; the others scabrous: the chaffy scales of the pappus dilated at the base, tapering gradually into the long awn: involucre more evidently calyculate.*—EUCALAIS, DC. (Uropappus § Brachycarpa, *Nutt.*)

1. *C. Douglasii* (DC.! l. c.): scapose, somewhat hairy when young; leaves linear-lanceolate, entire, or remotely pinnatifid, with the lobes linear and short (pappus reddish, *DC.*, or straw-color, *Nutt.*).—*Hook. & Arn. bot. Beechey, suppl. p.* 361. Uropappus (Brachycarpa) heterocarpus, *Nutt. in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 425.

California, *Douglas, Nuttall.*—Plant 6 inches high. Flowers pale yellow, small. *Nutt.*—We have only seen this plant in the herbarium of De Candolle. The character given by Hooker & Arnott embraces the phrase: "pappi paleis appresse villosis."

§ 2. *Achenia all similar and glabrous, tapering into a short beak, the angles minutely muricate-scabrous: chaffy scales of the pappus bifid at the apex; the midrib produced between the teeth into an awn of variable length: exterior involucral scales unequal.*—CALOCALAIS, DC. (Uropappus § Calocalais, *Nutt.*)

2. *C. linearifolia* (DC.! l. c.): scapose or caulescent; leaves linear, elongated, ciliate with soft hairs when young, often puberulent, as well as the base of the stem, either entire, remotely toothed, or the lower laciniate-pinnatifid (pappus either silvery-white or tawny).—*Hook. & Arn.! l. c.* C. linearifolia & C. Lindleyi, *DC. l. c.* (excl. syn.) Uropappus grandiflorus! U. linearifolius! & U. Lindleyi, *Nutt.! l. c.*

California, *Douglas! Nuttall!*—Plant 10–14 inches high; the long scapoid peduncles very fistulous. The capillary awn much shorter than the chaff of the pappus; one or two of them in some of the flowers scarcely if at all exserted beyond the cleft.—Nuttall's Uropappus grandiflorus is exactly the Douglasian C. linearifolia: his U. Lindleyi is founded merely on the character of De Candolle: his U. linearifolius is a state with rather smaller heads, &c.

183. CICHORIUM. *Tourn.; Linn.; Gærtn. fr. t.* 157; *DC. prodr.* 7. *p.* 84.

Heads chiefly many-flowered. Involucre double; the exterior of about 5 short spreading scales; the inner of 8–10 scales. Achenia somewhat compressed, striate, glabrous. Pappus of numerous very small chaffy squamellæ,

in 1–2 series.—Branching herbs (natives of the old world), with the radical leaves toothed or runcinate; the heads axillary and nearly sessile, or terminating the branches. Flowers bright blue, sometimes varying to white.

1. *C. Intybus* (Linn.): lower leaves runcinate, hispid-scabrous on the carinate midrib; the cauline small, oblong or lanceolate, partly clasping, sinuate-toothed or nearly entire; those of the branches inconspicuous; heads mostly 2–3 together, sessile.—*Engl. bot. t.* 538; *Schkuhr, handb. t.* 226; *Pursh, fl.* 2. *p.* 496; *Hook.! fl. Bor.-Am.* 1. *p.* 296; *Darlingt. fl. Cest. p.* 440.

Old fields and road-sides, naturalized in Canada! and the Northern and Middle States! Aug.–Sept.—24 Flowers showy.—*Wild Succory.*

Subtribe 3. SCORZONEREÆ, *Less.*—Receptacle not chaffy. Pappus of chaffy or stout bristles, which are dilated at the base, or else plumose.

184. STEPHANOMERIA. *Nutt. in trans. Amer. phil. soc. l. c.* 7. *p.* 427.

Heads 3–6-flowered. Involucre cylindrical, composed of 3–5 oblong-linear one-nerved equal scales, and of a few short calyculate scales at the base. Receptacle scrobiculate, naked. Achenia oblong, strongly 5-angled or 5-grooved, glabrous, not rostrate, scarcely if at all attenuated at either end. Pappus (white) of 15–24 plumose filiform bristles (which are gradually but slightly stouter towards the base), in a single series.—Diffuse and much branched rather rigid and glaucescent herbs (natives of the sterile plains, &c. on both sides of the Rocky Mountains), with the aspect of Chondrilla; the lower leaves linear and often runcinate; those of the nearly naked branches minute and bract-like, linear-subulate, entire. Heads small, solitary, terminating the branchlets. Flowers rose-color.

These plants have exactly the habit of Lygodesmia; from which they chiefly differ in their plumose pappus.

§ 1. *Perennial: roots thick and often tortuous: heads* 5–6-*flowered.*

1. *S. minor* (Nutt.! l. c.): branches somewhat striate; leaves linear-subulate, entire: heads 5-flowered.—Prenanthes? tenuifolia, *Torr.! in Ann. lyc. New York*, 2. *p.* 210, not of Spreng. Lygodesmia minor, *Hook.! fl. Bor.-Am.* 1. *p.* 205, *t.* 103, *A.*

Plains and hills of the Oregon, near the Wallawallah, &c. *Douglas! Nuttall!* Plains of the Platte, *Dr. James!*—July–Aug.—A foot or more in height. Achenia strongly 5-sulcate, sometimes very obscurely wrinkled or rugose, probably smooth and even when mature. Pappus of 16–24 beautifully plumose bristles.

2. *S. runcinata* (Nutt.! l. c.): branches flexuous, somewhat striate; radical and lower cauline leaves runcinate, more or less pubescent when young; those of the fertile branches linear or subulate, the lower often 1–2-toothed; heads 5–6-flowered.—Prenanthes runcinatum, *James, in Long's exped.* P.? pauciflora, *Torr.! in ann. lyc. New York*, 2. *p.* 210. S. runcinata & S. heterophylla, *Nutt.! l. c.*

Plains of the Platte at the base of the Rocky Mountains, *Dr. James! Lieut. Fremont!* Also on Big Sandy Creek, one of the sources of the Colorado of the West, *Nuttall!* July–Aug.—Plant 4–8 inches high.

§ 2. *Annual: heads 3–5-flowered.*

3. *S. paniculata* (Nutt.! l. c.): stems stout, erect, striate, virgate, bearing numerous short paniculate flowering branches; cauline leaves linear, the lower often toothed or sagittate at the base; those of the branches minute; mostly 5-flowered.

Plains of the Rocky Mountains, near the Colorado of the West, *Nuttall!* —Stem 2 feet or more in height. Heads smaller and more slender than in the preceding, terminal and lateral, and subsessile along the branchlets. Achenia 5-angled, obscurely rugose. Bristles of the pappus 15–20, grayish, at length brownish.

4. *S. exigua* (Nutt.! l. c.): diffusely much branched, the branches slender; radical leaves runcinate-pinnatifid; those of the branches reduced to minute scales; heads 3–4- (sometimes 5-) flowered.

Plains of the Rocky Mountains, with the preceding, *Nuttall!*—Heads still smaller than in S. paniculata, scarcely a line in diameter, 3–4 lines in length.

185. RAFINESQUIA. *Nutt. in trans. Amer. phil. soc. (n. ser.)* 7. *p.* 429.

Heads many-flowered. Scales of the cylindraceous involucre about 15, somewhat in 2 series, linear-acuminate from a broadish base, with scarious margins, subtended by a few short and spreading calyculate scales or bracts. Receptacle naked, puncticulate. Achenia terete, nearly even, smooth or the exterior minutely scabrous-pubescent, with the basilar areola terminal, tapering above into a long filiform beak. Pappus of 12–15 uniform slender and fragile plumose bristles, nearly in a single series, deciduous.—An annual corymbosely much branched glabrous herb, with the aspect of a Sonchus. Leaves runcinate or lyrately pinnatifid, clasping, lanceolate; those of the branches small. Heads rather large, terminating the fastigiate minutely bracteate branches. Flowers white.

R. Californica (Nutt.! l. c.)

St. Diego, California, near the coast.—Stem 2–3 feet high, terete, purplish. Involucre at length enlarging at the base and becoming conical, as in Sonchus. Flowers fugacious, but little exserted, externally dark purple in the centre of the ligule. Achenium shorter than the very slender and nearly smooth beak.

186. LEONTODON. *Linn.* (excl. spec.); *Juss.*; *Koch, syn. p.* 418.

Heads many-flowered. Involucre scarcely imbricated; the exterior or accessory scales shorter and bracteolate, in 1–3 series. Receptacle naked, punctate, or sometimes fimbrillate in the centre. Achenia all similar, terete, striate, transversely rugulose, tapering to the apex or somewhat rostrate. Pappus persistent, composed of 1 or 2 series of plumose bristles, which are scariose-dilated at the base, or the exterior short and filiform.—Acaulescent perennial (chiefly European) herbs; with radical, toothed, or pinnatifid leaves. Flowers white.

§ *Scapes usually branched: involucre obconical, many-bracteolate: achenia fusiform: pappus a single series of (dirty white or tawny) equal plumose bristles, which are lanceolate-thickened at the base.*—OPORINIA, Don, DC.

1. *L. autumnale* (Linn.): root præmorse, fibrose; leaves more or less pinnatifid; peduncles paniculate-corymbose, thickened at the summit, and furnished with small scaly bracts; involucre obovoid-oblong, more or less pubescent.—*Koch, syn. fl. Germ. & Helv. p.* 418. Hedypnois autumnalis, *Huds.; Engl. bot. t.* 830. Apargia autumnalis, *Willd.; Schkuhr, handb. t.* 220; *Pursh, fl.* 2. *p.* 497; *Bigel.! fl. Bost. ed.* 2. *p.* 285; *Hook.! fl. Bor.-Am.* 1. *p.* 296. Oporinia autumnalis, *Don, in Edinb. phil. jour.* 6. (1829); *Beck, bot. p.* 168; *DC.! prodr.* 7. *p.* 108.

Newfoundland, *Pylaie! Mr. Cormack!* perhaps native. Naturalized in pastures and roadsides throughout the eastern part of the New England States! Aug.–Oct.

Subtribe 4. LACTUCEÆ, *Cass.* (Lactuceæ & Hieracieæ, *Less., DC.*)—Receptacle not chaffy. Pappus capillary; the bristles mostly soft or fragile, not dilated or thickened at the base, nor plumose.

187. APARGIDIUM.

Head many-flowered. Scales of the campanulate-cylindrical involucre narrowly lanceolate, acuminate, strongly one-nerved; the inner nearly in a single series; the exterior few, short and subulate-bracteolate. Receptacle naked. Tube of the corolla villous. Immature achenia oblong, slightly obcompressed, glabrous, not ribbed, nor attenuated at either end. Pappus of copious rather rigid and fragile barbellate-denticulate capillary bristles, nearly in a single series, scarcely thickened downwards, brownish.—A slender glabrous acaulescent perennial herb; with fibrous-fasciculate often tuberiferous roots, and narrowly linear-lanceolate obscurely denticulate leaves, arising from a short caudex. Head solitary, on an elongated naked scape, at first nodding. Flowers light yellow.

A. boreale.—Apargia borealis, *Bongard! veg. Sitcha, in mem. acad. St. Petersb. l. c. p.* 146. Leontodon boreale, *DC.! prodr.* 7. *p.* 102. Crepis borealis, *C. H. Schultz, ined.*

Sitcha, *Bongard!* Oregon, *Mr. Tolmie!*—Scape longer than the leaves, slender, 4–12 inches high. Leaves 2–4 lines wide, tapering to both ends, acute, one-nerved, furnished with here and there a slight retrorse tooth, somewhat petioled. Head about as large as in the common Dandelion: scales of the involucre erect. Mature achenia unknown.—The pappus is neither plumose nor white, as described by Bongard, but between barbellate and denticulate, and dull light brown.

188. HIERACIUM. *Tourn.; Linn.; Gærtn. fr. t.* 158; *Schkuhr, handb. t.* 221; *DC. prodr.* 7. *p.* 202.

Heads many-flowered. Scales of the involucre imbricated, or only in two series, of which the outer is short and somewhat calyculate.

Receptacle scrobiculate, or slightly alveolate-fimbrillate. Achenia oblong or columnar, often subclavate, rarely fusiform, striate or ribbed, not rostrate. Pappus consisting of a single series of persistent but very fragile denticulate-scabrous bristles, brownish-white or fuscous.—Perennial herbs (chiefly of the northern hemisphere); with entire or toothed leaves, many of the European species stoloniferous; the softer pubescence often stellate; the bristly hairs frequently glandular or denticulate. Flowers yellow, very rarely orange or white.

§ 1. *Involucre imbricated: achenia usually tapering towards the base, but never towards the summit (heads commonly rather large.)*—EUHIERACIUM.

1. *H. alpinum* (Linn.): stem bearing about a single leaf and a solitary ventricose head; leaves oblong-lanceolate, entire or somewhat toothed, bearing both villous and glandular hairs; scales of the involucre rather loose, villous; ligules pubescent externally.—*Engl. bot. t.* 1119; *Frœl.! in DC. prodr.* 7. *p.* 208.

Greenland! (*v. sp. in herb. Greene.*)—The H. pusillum, *Pursh!* (*fl.* 2. *p.* 502), which this author suggests may be only a diminutive variety of H. alpinum, and which is therefore referred to that species by E. Meyer, &c., proves, on examination of the authentic specimen in *herb. Lamb.* (from *herb. Dickson*) to be Erigeron alpinum!

2. *H. vulgatum* (Fries): stem erect, somewhat flexuous, naked above, corymbose at the summit; leaves lanceolate, attenuate at both ends, coarsely [or obscurely] toothed, entire towards the apex, petioled, villous; involucre obtuse, hirsute and glanduliferous; pappus nearly white. *Frœl. in DC.—Fries, novit. Suec. ed.* 2. *p.* 259. (H. sylvaticum, *Fl. Dan. t.* 1113, (not of *Linn., Wahl. &c.*) and H. murorum *a*, *Linn*, in part, fide *Fries, l. c.*) H. molle, *Pursh! fl.* 2. *p.* 503, not of *Jacq.* H. sylvaticum, *Schlecht. in Linnæa*, 10. *p.* 87; *Hook. fl. Bor.-Am*, 1. *p.* 299?

Greenland, *Fries.* Labrador, *Kohlmeister! Henne*, ex *Schlecht.* Point Levi, Lower Canada, *Mrs. Sheppard*, ex *Hook.* (if we have correctly referred the synonym.)—A variable species, allied to H. sylvaticum and H. murorum, with the heads resembling in size and form those of H. molle (Crepis hieracioides, *Waldst. & Kit.*), for which Pursh mistook it.

3. *H. prenanthoides* (Vill.): stem simple, strict, leafy, corymbose at the summit; leaves membranaceous, denticulate, ciliate, reticulated and glaucous beneath; the cauline oblong-lanceolate, clasping; the lower narrowed and auriculate at the base; the peduncles and oblong heads glandular-hirsute. *Frœl. in DC. l. c.—Vill. Delph.* 3. *p.* 108, & *voy. p.* 58, *t.* 3, *f.* 3; *Fries, novit. Suec. ed.* 2. *p.* 261.

Greenland, *Fries.* (A stouter variety, not glaucous, and hairy throughout.) —Leaves varying from cordate to ovate-oblong, lanceolate, and lingulate, always acute. *Fries.*

4. *H. Canadense* (Michx.): stem erect, simple or sparingly branched above, leafy; leaves sessile, lanceolate or ovate-oblong, acute, sparingly pubescent or hairy, especially on the midrib and veins beneath, or nearly glabrous, scabrous-ciliolate, remotely and often incisely dentate with a few sharp and spreading or divaricate teeth; the upper obtuse at the base, often somewhat auriculate and partly clasping; heads (showy) corymbose; involucre somewhat glabrous; the exterior subulate scales mostly spreading in fruit, the others appressed; receptacle somewhat alveolate, fimbrillate-toothed.—*Michx.! fl.* 2. *p.* 86; *Monnier! ess. Hier. p.* 37. H. virgatum, fasciculatum,

& macrophyllum, *Pursh, fl.* 2. *p.* 504. H. Kalmii, *Spreng. syst.* 3. *p.* 646; *Bigel.! fl. Bost. ed.* 2. *p.* 288; *Torr.! compend.*; not of *Linn.*, &c. H. Canadense? hirsutum? (but these are described from garden specimens, which probably belong to H. Sabaudum or H. sylvestre,) helianthifolium, & Sabaudum *β.* Canadense, *Frœl. in DC. prodr.*—Varies as to pubescence, the size and breadth of the leaves, &c.; and distinguishable, but not definitely so, into the two following forms; the first or Northern state nearly approaching the European; H. umbellatum the second, H. sylvestre, Sabaudum, &c.

a. angustifolium: leaves varying from narrowly to broadly lanceolate.—H. umbellatum, *Richards. appx. Frankl. journ. ed.* 2. *p.* 29; *Hook.! fl. Bor.-Am.* 1. *p.* 300, excl. syn. H. Canadense *β.* scabruum, *Schweinitz! in Long's 2nd exped. appx.* H. scabriusculum, *Schweinitz! l. c.* H. macranthum, *Nutt. in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 446.

β. latifolium: leaves varying from oblong-lanceolate to lanceolate-ovate; the upper frequently somewhat cordate at the base.—H. macrophyllum, *Pursh, l. c.* H. prenanthoides, *Hook.! l. c.*, excl. syn.

Dry soil in open places, from Massachusetts! and Western New York! to Canada! Lake Superior! &c. (chiefly var. *β.*); extending (var. *a.*) north to lat. 66° on Mackenzie River, *Richardson! Drummond!* and west to Oregon, *Nuttall!* July–Aug.—Stem 1–2 feet high, stout, either slightly pubescent, or glabrous below and scabrous-puberulent above, the peduncles downy; or else hirsute, with the downy peduncles sparsely hispid with brownish bristles: the close downy pubescence stellate; the bristly hairs denticulate-scabrous under a lens. Heads pretty large: the involucre either glabrous, slightly pubescent, or sometimes sparingly beset with bristly and somewhat glandular hairs. Leaves thickish and roughish when the plant grows in exposed situations, rather thin and smooth when in shade.

§ 2. *Involucre cylindrical; the inner scales in a single series; the others few and short, calyculate: achenia columnar or fusiform!* (*heads small,* 20–30-*flowered: bristly hairs when present scabrous-serrate or denticulate under a lens.*)—STENOTHECA, Monnier. (Stenotheca & species of Hieracium, *Monnier.* Species of Aracium, *Neck.? Less.*)

* *Natives of Eastern North America.*

5. *H. scabrum* (Michx.): stem rather stout, leafy, scabrous, hirsute or hispid below; the flexuous panicle simple or compound, at first racemose, but at length somewhat fastigiate-corymbose; leaves obovate, oval, or spatulate-oblong, often denticulate, mucronate, hirsute; the upper closely sessile; the thickish peduncles, with the rachis and the base of the somewhat campanulate many- (40–50-) flowered involucre cinereous-tomentose and densely glandular-hispid; achenia columnar, not attenuated at the summit!—*Michx.! fl.* 2. *p.* 86; *Pursh, fl.* 2. *p.* 504; *Monnier, l. c. p.* 31; *Frœl.! in DC. l. c.* H. Marianum, *Willd. l. c.* (*herb.!*) in part; *Ell. l. c.*; *Bigel. fl. Bost. ed.* 2. *p.* 288 (at least in part). H. Gronovii *β. Hook.! fl. Bor.-Am. l. c.*

Borders of woods, &c., from Northern Canada! to Missouri! Kentucky! and the upper part of Georgia! common in the Northern States!—Aug.–Sept.—Stem 1–3 feet high, rough. Upper surface of the leaves hispid or hirsute with scattered bristly hairs, arising from a brownish dilated base. Heads larger than in H. Gronovii, and with more numerous flowers than any other species of this section. The whole panicle is remarkably stiff (the short peduncles divaricate), and thickly beset with brownish glanduliferous hairs, as well as with a close tomentum.

6. *H. longipilum* (Torr.): stem virgate, simple, very leafy towards or near the base, naked and somewhat glabrous towards the summit, bearing a small racemose panicle; the lower portion, and both sides of the oblong-lanceolate or spatulate-lanceolate entire leaves densely clothed throughout with very long and strict slender bristles; the spreading at length subcorymbose peduncles, with the 20–30-flowered involucre, cinereous-pubescent or tomentose and glandular-hispid; achenia fusiform, attenuated at the summit!—*Torr.! in Hook. fl. Bor.-Am.* 1. *p.* 298. (note under H. Scouleri, 1833.) H. barbatum, *Nutt.! in jour. acad. Philad.* 7. *p.* 70 (1834), *& in trans. Amer. phil. soc. l. c.*; not of *Lois.*, or of *Tausch.*

Prairies and open woods, from Michigan! to Illinois! Missouri! and Arkansas! extending nearly to the Rocky Mountains, according to Nuttall. July–Sept.—Stem 15–30 inches high, very strict. Leaves 3–6 inches long, an inch or less in width, tapering to the base, mostly sessile; the uppermost reduced to bracts. Inflorescence nearly as in H. scabrum; the heads smaller than in that species, but larger than is usual in H. Gronovii. Scales of the involucre subulate. Achenia scarcely as much attenuated above as in H. Gronovii. The bristly hairs which so remarkably distinguish this plant, which are either whitish or brownish, are all ascending, not shaggy, but straight and even, as if combed, and are frequently an inch in length! They are slightly dilated or papilliform at the base, and are denticulate under a lens, as in all the species of this section.—We should not have deemed it proper to restore the name under which this singular plant was first indicated, though not fully described, were it not probable that the H. barbatum of Tausch and Reichenbach will continue a distinct species, and necessarily retain that name.

7. *H. Gronovii* (Linn.): stem virgate, leafy and very hirsute below, naked and minutely pubescent towards the summit, forming an elongated panicle; leaves entire or denticulate, mucronulate, pale, villous-hirsute, especially along the midrib beneath and the margins; the radical and lower cauline oblong-obovate or spatulate; the upper oval or oblong, closely sessile or partly clasping; the slender peduncles and the base of the involucre more or less hispid with glanduliferous hairs; achenia fusiform and almost rostrate! —*Linn.! spec. l. c.*, as to pl. *Gronov.*; *Michx.! fl.* 2. *p.* 87 (*β.* foliosum); *Pursh, fl.* 2. *p.* 503; *Ell. sk.* 2. *p.* 263; *Hook.! fl. Bor.-Am.* 1. *p.* 298 (var. *α.*); not of *herb. Linn.*, *Willd.*, *Frœl. in DC.*, &c. H. foliis rad. obverse ovatis, &c., *Gronov.! fl. Virg. p.* 114. H. Marianum Pulmonariæ Gallicæ folio, *Pluk. mant. p.* 102, *t.* 420, *f.* 2. H. Marianum, *Willd. spec.* 3. *p.* 1572 (at least partly!); *Frœl.! in DC. l. c.*; *Nutt.! in trans. Amer. phil. soc. l. c. p.* 446. Stenotheca Mariana, *Monnier*, *Hier. p.* 72, *t.* 2, *f. A.*

β. subnudum: stem slender, with one or few leaves near the base, naked and often glabrous above.—H. subnudum, *Frœl. l. c.?* (*herb. DC.*! partly.) Stenotheca subnuda, *Monnier*, *l. c. t.* 2. *f. A*, *no.* 5 (fruit).

γ. hirsutissimum: stem (except the summit) and leaves strongly hirsute with very long shaggy hairs, arising from small papillæ.

Dry sterile soil, common from Canada! to Florida! Louisiana! Arkansas! and Texas! *γ.* Southern and Western States! July–Sept.—The narrow and elongated panicle, the hairy base of the stem, and the achenia tapering so that they might be termed rostrate, abundantly distinguish the depauperate forms of this species from H. venosum. The more robust states have often been confounded with H. scabrum.—From Tampa Bay, Florida, we have a specimen of what appears to be a variety of this species, with the pappus pure white when young, agreeing therefore in every respect with the character of Crepis.

8. *H. venosum* (Linn.): stem or scape naked or with a single leaf, glabrous, slender, several times dichotomous, forming a diffuse compound corymb (the divisions subtended by a subulate bract); radical leaves obovate

or spatulate-oblong, entire or obscurely denticulate, slightly petioled, thin and pale, often purplish and glaucous beneath, mostly with purple veins, the margins and especially the midrib beneath villous, the surfaces often glabrous; the filiform divaricate peduncles and base of the involucre either glabrous or sparsely and minutely hispid with short glanduliferous hairs; achenia linear (very obscurely if at all narrowed at the summit).—*Linn. spec.* 2. *p.* 800; *Willd.! spec.* 3. *p.* 1570; *Pursh, fl.* 2. *p.* 502; *Ell. sk.* 2. *p.* 262; *Hook. fl. Bor.-Am.* 1. *p.* 297; *Darlingt.! fl. Cest. p.* 446; *Frœl.! in DC. prodr.* 7. *p.* 217. Stenotheca venosa, *Monnier, Hier. p.* 72.

β. subcaulescens: stem more or less leafy near the base; the cauline leaves varying from ovate to lanceolate, sessile or slightly clasping.—H. Gronovii, *Linn.! herb., & spec.* 2. *p.* 802, as to char. (not as to syn. *Gronov.!*); *Willd.! l. c.*; *Michx. fl.* 2. *p.* 87 (var. *a.*); *Monnier, l. c. p.* 30; *Frœl.! in DC. l. c.*

In dry soil, pine woods, &c., Canada! and Saskatchawan! to Kentucky! and the upper portion of Georgia! &c.: most abundant in the Northern and New England States! May–July.—Scape 1–2 feet high. Earlier radical leaves appressed to the ground, sparsely hirsute above; the cauline when present at length glabrous. Heads small, about 20-flowered: the ligules long, bright yellow. Inner or principal scales of the involucre about 10, glabrous or nearly so.—There is no specimen in the herbarium of Linnæus with this name: we know not whence he obtained the character, "scapo crassissimo."—*Hawk-weed. Rattle-snake-weed.* (One of the reputed antidotes to the bite of venomous snakes.)

9. *H. paniculatum* (Linn.): stem slender, leafy, paniculate, villous towards the base; leaves lanceolate or oval-lanceolate, acute at each end, denticulate, sessile, membranaceous, glabrous; panicle diffuse, mostly compound, dichotomous; the slender filiform branches and peduncles divaricate, nearly glabrous, as well as the (few) scales of the 12–20-flowered involucre; achenia short, not at all contracted at the apex.—*Linn.! spec.* 2. *p.* 802; *Michx.! fl.* 2. *p.* 86; *Pursh, l. c.*; *Hook.! l. c.*; *Darlingt.! fl. Cest. p.* 447; *Frœl.! in DC. prodr.* 7. *p.* 222.

Woodlands, Canada! and Northern States! to the mountains of Georgia! Aug.–Sept.—Heads smaller than in any other species of the genus: the involucre of fewer scales even than H. venosum; but the achenia as in the proper Hieracia.

* * *Natives of Oregon and the North West Coast.*

10. *H. triste* (Willd. herb.): stem slender, simple, bearing one or two leaves, and few or several racemose or paniculate heads; leaves oblong-spatulate, entire or obscurely denticulate, villous or nearly glabrous, tapering into slender petioles; the upper cauline lanceolate; peduncles, the summit of the stem, and especially the involucre cinereous-woolly and hirsute with long brownish hairs (which are seldom glanduliferous); achenia oblong, not narrowed at the summit.—*Spreng.! syst.* 3. *p.* 640. H. triste & H. arcticum, *Frœl. in DC. prodr.* 7. *p.* 209. H. gracile, *Hook.! fl. Bor.-Am.* 1. *p.* 298, not of *Frœl. in DC. l. c. p.* 231. H. Hookeri, *Steud. nomenc. ed.* 2. *p.* 763.

Unalaschka, Norfolk Sound, &c. *Chamisso!* Northern and higher Rocky Mountains, *Drummond!*—A span to a foot or more high. Heads about as large as in H. venosum: the ligules very short. Involucre &c. remarkably clothed with long grayish-brown hairs.

11. *H. Scouleri* (Hook.): stem paniculate-branched, either smooth and glabrous, except the base, or hispid with divaricate-spreading long bristly hairs, leafy below; leaves lanceolate-oblong, acute or mucronate, mostly

entire, sessile or nearly so, hispid with spreading hairs; panicle compound; the erect peduncles and the (about 20-flowered) involucre more or less glandular-hispid; achenia columnar, not narrowed at the summit.—*Hook.! fl. Bor.-Am.* 1. *p.* 298.

Nootka, and at the mouth of the Oregon, *Dr. Scouler!* On the Wahlamet, *Nuttall.*—A foot high, clothed with fuscous or brownish bristly hairs (distinctly denticulate under a lens), like those of H. longipilum, except that they are much shorter and spreading. Heads small; the involucre sparingly calyculate, clothed with short mostly glanduliferous hairs, or in some specimens nearly glabrous.—We suppose that the specimen from Pennsylvania, mentioned by Hooker, belongs to H. Gronovii.

12. *H. albiflorum* (Hook.): stem simple, naked and glabrous above, bearing a compound corymb, leafy and hispid near the base, like the petioles and midrib of the leaves, with slender reflexed bristly hairs; leaves lanceolate-oblong, hirsute, entire; the lower tapering into a short petiole, the uppermost small and sessile; peduncles short, divaricate, minutely bracteolate, nearly glabrous; the scarcely calyculate involucre very sparingly hirsute with slender bristly hairs; achenia columnar, not narrowed at the summit; flowers white!—*Hook.! fl. Bor.-Am.* 1. *p.* 298; *Nutt.! in trans. Amer. phil. soc. l. c. p.* 446.

Alpine woods in the Rocky Mountains, north of Smoking River, lat. 56°, *Drummond!* Also around Fort Vancouver, Oregon, *Nuttall.*—Stem 1–3 feet high. Heads about as large as in H. venosum.

‡ *Obscure or little-known species.*

13. *H.? Kalmii* (Linn.): stem erect, many-flowered; leaves lanceolate, toothed; peduncles tomentose. (Stem erect, smooth, narrower than in H. Sabaudum. Leaves lanceolate, alternate, subsessile, small, naked, acuminate, dentate with sharper spreading teeth than in any other species of the genus. Peduncles alternate at the summit of the stem, commonly simple and one-flowered, whitish-tomentose; bracts few and sparse, linear. Flowers small, terminal, erect.) *Linn.! spec.* 2. *p.* 804; not of *Spreng.* &c., neither of *Monnier* (under the name of Sclerolepis), nor of *Less.* (under the name of Pachylepis.)

Pennsylvania, *Kalm.* (*v. sp. in herb. Linn.*)—Heads and flowers about as large as in Erigeron strigosum. Scales of the involucre narrowly linear, glabrous, not rigid, plane, in a single series, with a few exterior and shorter ones. Corolla apparently yellow. Receptacle naked? Ovaries similar in all the flowers, somewhat turbinate, glabrous, not striate, neither rostrate nor in the least attenuated at the summit. Pappus a single series of fragile strongly denticulate-scabrous bristles, brownish-white.—It is singular that this plant, if it were really collected in Pennsylvania, has never been met with since the time of Kalm. The above particulars, which an inspection of the original specimen enables us to add to the excellent general description of Linnæus, clearly show that this lost species has no affinity whatever with the plant which Monnier (we know not on what grounds) mistook for it, and described under the name of *Sclerolepis Kalmii* (*Ess. Hierac. p.* 81, *t.* 4, *f. D.*), and which is adopted by Lessing (*Syn. Compos. p.* 129) and De Candolle (*Prodr.* 7. *p.* 98), under the name of *Pachylepis*. Mounier does not state the source whence his specimens were derived; but we are confident that his plant (which is nearly allied to Zacintha and Pterotheca) is not of North American origin, and therefore have not introduced it into our Flora.

14. *H. argutum* (Nutt.): leaves and base of the stem clothed with long reflexed hairs; stem smooth, paniculate, the branches divaricate, with long naked and smooth pedicels; leaves oblong or oblong-lanceolate, all incisely

and sharply toothed, acute; the cauline few and sessile; involucre small, slightly bracteolate, smooth and blackish-green, of few scales in about 2 series; pappus gray and scabrous; achenia not attenuate at the summit; flowers white? *Nutt. in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 447.

St. Barbara, California, *Nuttall.*—This plant is unknown to us; and only a single specimen was collected.

189. NABALUS. *Cass. dict.* 34. *p.* 94 (1825); *Hook. fl. Bor.-Am.* 1. *p.* 293.

Harpalyce, *Don* (1829), not of *DC.*—Species of Prenanthes, *Linn.*

Heads several-(5–30-) flowered. Involucre cylindrical, of 5–14 linear scales in a single series, and calyculate with several short accessory scales. Receptable naked. Branches of the style much exserted. Achenia linear-oblong, cylindraceous, striate or grooved, smooth, not contracted at the apex. Pappus of copious straw-color or brownish scabrous capillary bristles, somewhat fragile.—Perennial (North American) herbs; the erect leafy stem arising from a fusiform simple or branched tuber, which is extremely bitter to the taste. Leaves entire, or variously lobed. Head racemose or paniculate, usually nodding. Flowers whitish, ochroleucous, cream-color, or purplish.

§ 1. *Heads pendulous: involucre calyculate, few–several-flowered, glabrous (rarely more or less hairy). (Leaves very variable in the same species.)*

1. *N. albus* (Hook.): nearly glabrous, slightly glaucous, stem corymbosely paniculate at the summit (usually purplish); leaves angulate-hastate, irregularly toothed, sinuate-incised, or sometimes either palmately or somewhat pinnately 3–5-lobed or parted (the lobes or undivided leaves mostly obtuse, mucronate); the lower petioled; the uppermost usually oblong, subsessile; heads in short spreading racemes or panicles, somewhat corymbose; involucre (glaucous and usually purplish) of about 8 scales, 8–12-flowered; pappus deep cinnamon-color.—N. albus & N. serpentarius, *Hook. l. c.* (in part, and as to syn.) N. suavis, *DC.! l. c.* N. trifoliolatus, *Cass. in dict. sci. nat.* 34. *p.* 95. Prenanthes alba, *Linn.! hort. Cliff. p.* 383, & *spec. l. c.* (excl. β.); *Michx.! fl.* 2. *p.* 83; *Bot. mag. t.* 1079; *Pursh, l. c.*; *Bigel. fl. Bost. ed.* 2. *p.* 286 (partly); *Darlingt. fl. Cest. p.* 444 (partly). P. suavis, *Salisb. parad. Lond. t.* 85. P. rubicunda, *Willd.! spec.* 3. *p.* 1537 (*ex herb.*), excl. syn. P. Miamensis? ovata, & proteophylla, *Riddell, l. c.* Chondrilla alba, *Lam.*

β. *Serpentaria:* cauline leaves on slender petioles, deeply sinuate-pinnatifid or 3-parted, the terminal lobe 3-cleft, often sparsely ciliate with rough hairs.—Prenanthes Serpentaria, *Pursh, fl.* 2. *p.* 499, *t.* 24. Harpalyce Serpentaria, *Don, in Edinb. new. phil. journ.* 6. *p.* 305; *Beck, l. c.*

Open grounds and borders of woods, Newfoundland! Canada! and Northern States! to the Upper Mississippi! and the Mountains of the Southern States! Aug.–Sept.—A stouter plant than N. altissimus; the stem sometimes spotted. Leaves very variable, pale beneath; the margins mostly somewhat scabrous and ciliate. Heads half an inch or more in length. Achenia scarcely striate. Corolla white or ochroleucous, sometimes tinged with purple.—*White Lettuce. Lion's Foot. Rattlesnake-root.*

2. *N. altissimus* (Hook.): glabrous or nearly so; stem virgate; leaves (membranaceous) all petioled, either undivided or the lower palmately 3–5-

cleft, parted, or even divided; the lobes or leaves acuminate, repandly toothed or denticulate; heads in small axillary and terminal clusters, forming an elongated virgate panicle; involucre slender (greenish), of 5 scales, 5–6-flowered; pappus dirty white, or straw color.—*Hook.! fl. Bor.-Am.* 1. *p.* 294; *DC. prodr.* 7. *p.* 241 (ex syn.) (N. albus & N. serpentarius, *Hook. l. c.*, at least in part, fide *spec.!*) Sonchus elatus, &c. *Pluk.! alm. t.* 317, *f.* 2. Prenanthes altissima, *Linn.* spec. ed.* 2. *p.* 1121 (ex char. & syn. *Pluk.*); *Pursh, fl.* 2. *p.* 498; *Ell. sk.* 2. *p.* 256. P. parviflora, *Riddell, syn. Western plants, p.* 50. Chondrilla altissima, *Lam. dict.* 2. *p.* 78. Harpalyce altissima, *Beck, bot. p.* 167.

β. ovatus: cauline leaves nearly all ovate, abruptly contracted into winged petioles.

γ. cordatus: leaves mostly cordate, on slender petioles.—N. cordatus, *Hook. l. c.* Prenanthes cordata, *Willd.! hort. Berol. t.* 25; *Pursh, l. c; Ell. l. c.*

δ. deltoideus: leaves deltoid, strongly repand-toothed; the upper often cordate, on margined petioles; the radical and lowest cauline triangular-hastate, sometimes 3-parted.—N. deltoideus & N. cordatus! *DC. l. c.* Prenanthes deltoidea, *Ell.! sk.* 2. *p.* 257.

ε. dissectus: leaves all 3-parted or divided; the segments either entire or deeply 2–3-cleft; the lobes narrowly lanceolate or linear.

Woods, Newfoundland! Canada! and Northern States! to Kentucky! and the mountains of Georgia! Aug.–Sept.—Stem 3–5 feet high, rather slender, either simple or sparingly paniculate at the summit, sometimes pubescent below, as well as the midrib and margins of the leaves. Corolla yellowish or greenish-white.—A well-marked species, notwithstanding the extremely variable foliage, of which we have enumerated the most striking forms.

3. *N. Fraseri* (DC.! l. c.): glabrous or slightly puberulent; stem corymbose-paniculate at the summit; leaves mostly deltoid, usually somewhat scabrous, variously and often pinnately 3–7-lobed, and contracted into winged or margined petioles (the lobes short and mostly sinuate-denticulate); the upper subsessile, oblong-lanceolate, often undivided; racemes paniculate; involucre (greenish or slightly tinged with purple,) either glabrous or with a few scattered hairs, of about 8 scales, 8–12-flowered; pappus straw-color.—N. trilobatus, *Cass. in dict. sci. nat. l. c.?* N. Fraseri, N. trilobatus & N. serpentarius *β.*? *DC.! l. c.* Prenanthes folio scabro inciso . . . floribus dilute luteis, &c., *Clayt.! in Gronov. fl. Virg.* 3. *p.* 133. P. rubicunda, *Pursh, fl.* 2. *p.* 499, excl. syn. P. alba, *Ell. sk.* 2. *p.* 259.

β. integrifolius: leaves thickish, lanceolate-oblong, acute or obtuse, denticulate, or sharply and irregularly toothed; involucre often somewhat hairy.—N. integrifolius, *Cass. l. c.; DC.! l. c.*

γ. barbatus: leaves thickish, lanceolate or oblong, mostly sessile; the upper often somewhat auriculate-clasping, sinuate-toothed or nearly entire; racemes paniculate; involucre (12–15-flowered) hirsute when young with long purplish hairs!—Prenanthes crepidinea, *Ell. sk.* 2. *p.* 259, not of *Michx.*

Dry sterile or sandy soil, from Florida! and Alabama! to New York! Connecticut! and Newfoundland? *β.* Long Island, New York! and North Carolina! *γ.* Saluda Mountains of Carolina, *Dr. Macbride.* Alabama, *Mr. Buckley!* Sept.–Oct.—Stem 1–4 feet high, usually much branched: the leaves exceedingly variable. Flowers cream-color or ochroleucous.—This species, most abundant in the Southern States (where it is

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* The specimens of Prenanthes altissima and P. alba are evidently transposed in the Linnæan herbarium!

called *Gall-of-the-Earth*), resembles N. albus in its mode of growth, number of flowers, &c., but N. altissimus in its pappus. The very remarkable var. γ. but appears to pass through var. β. into the ordinary state of the plant.

4. *N. nanus* (DC.): glabrous; stem simple, low; leaves deltoid-hastate, angulate, or variously lobed or cleft, on slender petioles; heads in small axillary and terminal clusters, forming a strict racemose panicle; involucre (livid or blackish-green) 10–13-flowered, of about 8 obtusish proper scales; the bracteolate scales very short, triangular-ovate, appressed; bracts and bracteoles minute and subulate; pappus dark straw-color.—*DC.! prodr.* 7. *p.* 241. Prenanthes alba, var. nana, *Bigel.! fl. Bost. ed.* 2. *p.* 286; *Torr.! compend. p.* 277 (partly). Harpalyce alba β. *Beck. bot. p.* 167.

Alpine region of the White Mountains of New Hampshire! and of Essex County, New York! Aug.–Sept.—Plant 5–10 inches high. Leaves varying in the same manner as those of N. altissimus, either all undivided and hastate-triangular, angulate-toothed, or hastate-3-lobed; or else the lower or the whole 3-parted, with the divisions 2–3-cleft or entire, oblong or lanceolate, often somewhat ciliate when young, as well as the tips of the involucre. Heads nearly as large as in N. albus. Flowers whitish.

5. *N. Boottii* (DC.): stem simple, dwarf, pubescent at the summit when young; radical and lowest cauline leaves subcordate or hastate-cordate, obtuse; the middle oblong; the upper lanceolate, mostly entire, tapering into a margined petiole; heads in a simple or nearly simple raceme, slightly nodding; bracts and bracteoles linear; involucre (livid) 10–18-flowered, of 10–15 obtuse proper scales; the calyculate scales linear, lax, unequal, nearly half the length of the proper involucre; pappus straw-color.—*DC.! prodr.* 7. *p.* 241. Prenanthes alba, var. nana, in part, *Bigel.! l. c. &c.*

Higher alpine summits of the White Mountains of New Hampshire! On the extreme summit of Whiteface Mountain, Essex County, New York, *Mr. Macrae!* Aug.–Sept.—Plant 5–8 inches high. Scales of the involucre very obtuse, pubescent-ciliate when young; the calyculate scales nearly similar, but shorter and unequal. Flowers whitish.—Nearly allied as is this species to the preceding, yet the characters we have indicated appear to be constant. According to Mr. Tuckerman, the flowers are odorous in this species, but not in N. nanus.

6. *N. virgatus* (DC.): glabrous, somewhat glaucous; stem virgate, very simple; cauline leaves lanceolate, acute, closely sessile or partly clasping; the upper entire and gradually reduced to bracts; the lower toothed or pinnatifid; the radical tapering into a margined petiole, sinuately or runcinately and often deeply pinnatifid; the lobes lanceolate-linear or oblong; heads in small clusters, on short many-bracteolate peduncles (the minute bracteoles subulate), forming a very long and slender mostly unilateral spicate raceme; involucre (smooth and purplish) of about 8 proper scales, 8–12-flowered; pappus straw-color.—*DC.! l. c.*—Prenanthes virgata, *Michx.! fl.* 2. *p.* 83; *Willd.! spec.* 3. *p.* 1533; *Pursh, fl.* 2. *p.* 498; *Ell. sk.* 2. *p.* 258. P. simplex, *Pursh, l. c.* excl. syn. P. autumnalis, &c. *Gronov.! fl. Virg. ed.* 2. *p.* 113; *Walt.! Car. p.* 193. Sonchus virgatus, *Desf.*, ex *Steud.* Harpalyce virgata, *Beck. bot. p.* 167.

Moist places, in sandy fields and pine barrens, New Jersey! to Florida! in the low country. Sept.–Oct.—Stem 2–4 feet high; the naked wand-like raceme 1–2 feet long. Flowers purplish. ('*Dr. Witt's Snake-root.*' Clayt.)

§ 2. *Heads nodding or erect: involucre calyculate,* 12–35-*flowered, hirsute.* (*Leaves mostly undivided.*)

7. *N. racemosus* (Hook.): stem virgate, simple, and with the leaves smooth and glabrous; radical and lower cauline leaves oval, oblong, or oblanceolate,

sharply denticulate, tapering into winged petioles; the upper lanceolate or ovate-lanceolate, partly clasping, entire; heads in short racemes or fascicles, scarcely spreading, forming a long and narrow interrupted spicate panicle; involucre (of 8–10 scales) with the short peduncles very hirsute, about 12-flowered; pappus straw-color.—*Hook.! fl. Bor.-Am.* 1. *p.* 294; *DC.! l. c.* Prenanthes racemosa, *Michx.! fl.* 2. *p.* 84; *Torr.! compend. p.* 277. Harpalyce racemosa, *Don, l. c.*; *Beck, bot. p.* 168.

β. spicate panicles numerous, elongated (6–8 inches), crowded, forming a thyrsiform compound inflorescence.

γ. leaves deeply and irregularly laciniate-pinnatifid!

Canada! (Northern Canada, *Michaux!*) and Saskatchawan! Wisconsin! and Michigan! to the plains and prairies of Ohio! Also Hackensack marshes, New Jersey! *β.* & *γ.* Hackensack marshes, *Mr. J. Carey!* Sept.—Stem 2–5 feet high, striate. Flowers flesh-color or light purple.

8. *N. asper:* stem virgate, simple, and with the sessile leaves scabrous-pubescent; lower leaves oval-oblong, narrowed at the base, irregularly and sharply toothed; the upper oblong-lanceolate, closely sessile, often entire; heads mostly erect, in small fascicles, forming a long and narrow compound raceme; the short peduncles and rachis woolly-hirsute; involucre of 8–9 scales, very hirsute, 12–14-flowered; pappus straw-color.—N. Illinoensis, *DC. l. c.* Prenanthes aspera, *Michx.! fl.* 2. *p.* 83 (1803). P. Illinoensis, *Pers. syn.* 2. *p.* 366. Chondrilla Illinoensis, *Poir. suppl.* 2. *p.* 331.

Dry barrens and prairies of Ohio! Indiana! Illinois! Kentucky! Western Louisiana! and Upper Missouri! Sept.—Stem 2–4 feet high. Leaves small. Heads larger than in the preceding; the hairs of the involucre often purple. Flowers sulphur or cream-color.

9. *N. crepidineus* (DC.! l. c.): somewhat glabrous; stem tall and stout, corymbose-paniculate; leaves (ample) unequally toothed; the radical deltoid-hastate, the lower cauline triangular-ovate or deltoid-lanceolate, on winged petioles; those of the branches ovate-lanceolate or oblong, somewhat petioled; heads in small paniculate clusters, nodding, on short pubescent peduncles; involucre of 12–14 proper scales, hirsute, 20–35-flowered; pappus brownish. —Prenanthes crepidinea, *Michx.! fl.* 2. *p.* 84. P. gigantea, *Raf.! in herb. DC.* Hieracium crepidineum, *Frœl. mss.*

Borders of thickets and cultivated fields, Ohio! Indiana! and Illinois! to Kentucky! and the high mountains of Carolina. Aug.–Oct.—Plant 5–8 feet high. Lower leaves sometimes a foot long. Heads campanulate-cylindrical, large. Involucre blackish. Flowers ochroleucous.

§ 3. *Heads nearly erect, corymbose: involucre ecalyculate (with one or two inconspicuous bracteolate scales), somewhat pubescent, few-flowered.* (Indigenous to the North West Coast.)

10. *N. alatus* (Hook.): nearly glabrous; stem paniculate-corymbose at the summit; leaves membranaceous, deltoid, acuminate, sharply or laciniately toothed, with long winged petioles; the radical cordate; the uppermost cauline lanceolate, sessile; heads loosely corymbose; involucre of 7–9 lanceolate somewhat acuminate minutely pubescent scales, 7–9-flowered; pappus straw-color.—*Hook.! fl. Bor.-Am.* 1. *p.* 294, *t.* 202. Sonchus hastatus, *Less. in Linnæa*, 6. *p.* 99; *Bongard, veg. Sitcha, l. c. p.* 146. Mulgedium hastatum, *DC.! prodr.* 7. *p.* 250.

Unalaschka, &c. *Chamisso!* Sitcha (also Kamtschatka), *Bongard.* Observatory Inlet and Fort Vancouver, *Dr. Scouler!*—Plant a foot or more high. Root or tuber small, fusiform. Flowers flesh-color. *Mertens (Bongard).*

190. LYGODESMIA. *Don, in Edinb. phil. jour.* 6. *p.* 305 (excl. spec.); *Hook. fl. Bor-Am.* 1. *p.* 295; *DC.*

Lygodesmia & Erythremia, *Nutt.*

Heads 5–10-flowered. Involucre elongated cylindrical, of 5–8 linear scales in a single series, and calyculate with a few very short imbricated bracteolate scales. Receptacle scrobiculate. Branches of the style much exserted. Achenia linear, elongated, somewhat cylindrical, striate, smooth, not contracted at the apex. Pappus of very copious and scarcely scabrous whitish capillary bristles, in many series, rather persistent.—Perennial glabrous and somewhat glaucous rigid branching herbs (natives of sterile plains chiefly beyond the Mississippi), with the habit of Chondrilla: the leaves linear or subulate, entire; those of the branchlets reduced to mere scales. Root perpendicular. Heads solitary terminating the stem or branches, erect. Flowers reddish-purple or rose-color.

This genus differs from Prenanthes and Nabalus rather in its striking habit than in any marked or important floral characters.

§ 1. *Heads 5-flowered: pappus soft: stems very much branched, not spinescent.*—EULYGODESMIA.

1. *L. juncea* (Don! l. c.): stems very much branched, striate; lower linear-sublanceolate, rigid; the upper subulate.—*Hook.! fl. Bor.-Am.* 1. *p.* 295, *t.* 103; *DC. prodr.* 7. *p.* 198. Prenanthes juncea, *Pursh! fl.* 2. *p.* 498; *Nutt.! gen.* 2. *p.* 123.

Plains of the Missouri and Platte to the Rocky Mountains, *Lewis? Nuttall! Dr. James! Lieut. Fremont!* and of the Saskatchawan, *Drummond!* May–June.—About a foot high. Lower leaves 1–2 inches long. Flowers purple according to Pursh, rose-color according to Nuttall, blue according to Hooker. Pappus extremely copious, at first nearly white; the soft slender bristles scarcely at all scabrous. Mature achenia slender, half an inch long.

§ 2. *Heads 4–5-flowered: pappus rather rigid: stems divaricately much branched: the branchlets spinescent.*—PLEIACANTHUS, Nutt.

2. *L. spinosa* (Nutt.): stem and branches not striate, rigid; lower leaves linear, thickish; those of the branches reduced to minute bracts; proper scales of the rather short cylindraceous involucre about 4, lanceolate; the calyculate scales conspicuous, ovate.—*Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 444.

Plains of the Rocky Mountains towards California, *Nuttall!*—A span to a foot high, divaricate and spreading; "the base somewhat pubescent, and producing remarkably large tufts of brownish matted down." *Nutt.* Flowers rose-red. Pappus less copious and more rigid than in the preceding, by no means barbellate, as described by Nuttall, but appearing very slightly scabrous under a good lens. Mature achenia not seen.

§ 3. *Heads about* 10*-flowered: pappus rather soft: stems scapiform, sparingly branched: leaves mostly radical, linear and elongated, somewhat fleshy.* —ERYTHREMIA, Nutt.

3. *L. grandiflora:* dwarf; stems several from the same root (a span high), scarcely longer than the narrowly linear radical leaves.—Erythremia grandiflora, *Nutt.! in trans. Amer. phil. soc. l. c. p.* 445.

Borders of the Platte, near the Rocky Mountains, *Nuttall!*—Heads large for the size of the plant, equalling those of the following species. Proper scales of the involucre about 8; the calyculate scales ovate, ciliate. Ligules large and showy, rose-red. Achenia unknown. Pappus somewhat evidently denticulate-scabrous towards the base.

4. *L. aphylla* (DC. l. c.): stem slender, elongated, striate-angled, sparingly dichotomous towards the summit, many times longer than the attenuated linear-filiform chiefly radical leaves; bracts minute at the origin of the branches.—Prenanthes pumila, *Baldwin! mss.* P. aphylla, *Nutt.! gen.* 2. *p.* 123, *& in Sill. jour. p.* 299; *Ell.! sk.* 2. *p.* 261. Erythremia aphylla, *Nutt.! l. c. p.* 446.

β. Texana: stem stouter; leaves flattish, sparingly and remotely pinnatifid-laciniate. (Perhaps a distinct species.)

Pine barrens, St. Mary's, Georgia, *Baldwin!* Florida, *Mr. Croom! Dr. Chapman! Dr. Leavenworth!* &c. *β.* Texas, *Drummond!*—Stem about 2 feet high, nearly naked. Heads showy; the cylindrical involucre nearly an inch long: the calyculate scales very small, ciliate. Ligules large, rose-color. Achenia very long and slender. Pappus slightly fawn-colored, scarcely scabrous.

191. MALACOTHRIX. *DC. prodr.* 7. *p.* 192. (char. imperfect.)

Malacomeris, Leucoseris, & Leptoseris, *Nutt.*

Heads many-flowered. Involucre broadly campanulate or hemispherical; the scales narrow, numerous, more or less imbricated in 2–3 series, the exterior often calyculate. Receptacle naked. Ligules narrow. Achenia oblong, truncate at both ends, angled or nearly terete, 8–15-striate or ribbed, smooth, glabrous; the summit furnished (as in Andryala and many Hieracia) with a minute or inconspicuous crenulate or many-toothed ring, surrounding the base of the true pappus. Pappus consisting of a single series of slender and rather soft silvery-white capillary bristles (20–40 in number), which are serrulate-scabrous towards the apex, but minutely and sparsely barbellate near the base, deciduous.—Californian herbs (with a single and dubious exception), of somewhat varied aspect, mostly with a deciduous pubescence, and pinnatifid or undivided leaves. Flowers yellow or white.

This genus is most allied to Andryala; with which the section Leucoseris nearly agrees in habit, and from which the naked receptacle, the different pubescence, &c. chiefly distinguish it.

§ 1. *Annual, acaulescent: scales of the involucre narrowly linear, acuminate, in* 2–3 *series; the exterior shorter and loose: flowers yellow.*—EUMALACOTHRIX.

1. *M. Californica* (DC.! l. c.): softly and loosely villous when young, at

length somewhat glabrous; leaves all radical, clustered, linear-filiform, entire, or mostly sparingly pinnately-parted, much shorter than the naked simple scapes; heads solitary; immature achenia crowned with a minute pectinate border simulating an obscure setulose exterior pappus.

California, *Douglas!*—Scapes several from the slender and simple perpendicular root, fistulous, perfectly leafless, a span or more in height, terminated by a rather large head. Leaves very slender. Mature achenia unknown; the immature linear-oblong (certainly not obovate), obscurely striate. Pappus long, separating somewhat in a ring.

§ 2. *Suffruticose and perennial? subcaulescent: scales of the involucre linear, in about 2 rather unequal series, and with several calyculate bracteoles: flowers yellow.*—MALACOMERIS, Nutt.

2. *M. incana:* canescently tomentose with a somewhat deciduous wool; leaves chiefly radical, clustered, irregularly pinnatifid; the lobes (3–7) remote, short, oblong-linear; stem scapoid, bracteate, usually somewhat branched, and bearing 2 or 3 heads; achenia angled, many-striate, the border obsolete.—Malacomeris incana, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 435.

St. Diego, California, on an island in the bay, *Nuttall!*—Low, decumbent, nearly a span high; the radical leaves in close clusters, shorter than the flowering stems. Heads smaller than in the preceding. Achenia small, brownish. Pappus exactly as in M. Californica, but more copious.

§ 3. *Annual, subcaulescent* (*heads only* 30–40-*flowered*): *scales of the involucre in 2 series; the inner linear-lanceolate,* 12–15, *equal; the outer short and unequal, calyculate, appressed: flowers yellow.*—LEPTOSERIS, Nutt.

3. *M. sonchoides:* dwarf, glabrous; stems branching, somewhat corymbose; leaves linear-oblong, runcinate; the cauline small and scattered; the radical with short approximate lobes, spinulose-denticulate; achenia somewhat angled, striate-ribbed, crowned with a very minute and denticulate border, simulating an exterior obscure coroniform pappus.—Leptoseris sonchoides, *Nutt.! in trans. Amer. phil. soc. l. c. p.* 438.

Plains of the River Platte, *Nuttall!* June.—Plant 4–5 inches high, with several stems springing from a slender tap-root, bearing small heads, which resemble those of a Crepis. Exterior scales of the involucre erose-denticulate. Pappus exactly as in the preceding, but shorter, deciduous in a ring. Achenia pale.

§ 4. *Perennial, caulescent, leafy: scales of the involucre numerous; the inner linear, equal, appressed, in about 2 series; the outer short and calyculate, subulate, spreading, copious: flowers white.*—LEUCOSERIS, Nutt.

4. *M. saxatilis:* somewhat pubescent when young; stems diffuse or decumbent, leafy, branching; leaves fleshy, linear-oblong, obtuse, mostly entire; the lower occasionally somewhat serrate or pinnatifid towards the base; heads few, somewhat fastigiate; peduncles with minute subulate bracteoles; calyculate scales subulate-lanceolate, very numerous, imbricated; achenia somewhat angled, strongly ribbed, crowned with a minute denticulate border.—Leucoseris saxatilis, *Nutt.! in trans. Amer. phil. soc. l. c. p.* 440.

St. Barbara, California, on shelving rocks near the sea, *Nuttall!* April.—Stems 1–2 feet long. Leaves 2–3 inches in length, half an inch wide, often auriculate at the base, and partly clasping. Heads as large as those of the

Dandelion. Flowers very numerous, pure white. Achenia dark brown. Pappus as in the rest of the genus.

5. *M. commutata:* herbaceous, glabrous; stem erect, fistulous, striate, leafy, racemose-corymbose at the summit; leaves lanceolate-linear, sessile, acute, denticulate, those of the branches entire; heads terminating the simple branches; calyculate scales of the involucre subulate, squarrose-spreading, rather numerous; the proper scales very narrow and acute.—Hieracium? Californicum, *DC.! prodr.* 7. *p.* 235. Sonchus? Californicus, *Hook. & Arn. bot. Beechey, suppl. p.* 361. Leucoseris Californica, *Nutt. l. c.*

California, *Douglas!*—Stem 1–2 feet high. Leaves not fleshy, much narrower than in the preceding (to which it is very closely allied); the heads smaller, with the ligules in the dried specimens purplish underneath. Mature achenia unknown: ovaries with no manifest border or crown at the summit. Pappus as in the preceding.

6. *M. tenuifolia:* suffruticose, glabrous; stem erect, branching (2–3 feet high); leaves sessile, laciniate-pinnatifid, with long and narrowly linear lobes; the upper entire, filiform; heads few, corymbose. *Nutt.*—Leucoseris tenuifolia, *Nutt. l. c.*

St. Barbara, California, on the mountains near the town.—The expanded flowers and fruit not seen. Involucre as in M. saxatilis, but the scales narrower and more acuminate. *Nuttall.*

192. CREPIS. *Linn.* (excl. spec.); *Mœnch; DC. fl. Fr., & prodr. l. c.*

Heads several–many-flowered. Involucre mostly double; the inner or proper scales in a single series; the outer short and calyculate. Receptacle somewhat fimbrillate-hairy, or naked. Achenia terete or slightly compressed, mostly 10–30-striate, either columnar, narrowed at the apex, or obscurely attenuate-rostrate. Pappus copious, capillary, white; the bristles somewhat scabrous, usually very soft and slender (in H. chondrilloides, hyoseridifolia, pygmæa, &c., rather rigid and slightly thickened towards the base!).—Branching herbs (natives of the northern hemisphere), with nearly the involucre of Senecio. Leaves mostly toothed or pinnatifid. Flowers yellow.

§ 1. *Involucre many-flowered; the exterior calyculate scales often loose: receptacle naked or somewhat hairy: achenia mostly* 10–13*-striate.*—EUCREPIS, DC. (Crepidium & Psilochæna, *Nutt.*)

1. *C. runcinata:* perennial? radical leaves obovate-oblong or oblong-lanceolate, narrowed at the base and somewhat petioled, hirsute-pubescent on both sides, or at length glabrous, runcinate-toothed or somewhat incised, or frequently entire on the same plant; the cauline solitary or reduced to mere linear bracts at the bifurcations of the corymbosely branched scape; scales of the pubescent involucre linear-lanceolate, acute, with scarious margins; achenia somewhat attenuated upwards, smooth, scarcely as long as the pappus.—Hieracium runcinatum, *James, in Long's exped.* 1. *p.* 453; *Torr. in ann. lyc. New York,* 2. *p.* 209. Crepis biennis *β. Hook.! fl. Bor.-Am.* 1. *p.* 297, not of *Linn.* C. biennis *β.*? Americana, *DC. prodr.* 7. *p.* 163. Crepidium runcinatum, *Nutt.! in trans. Amer. phil. soc. l. c. p.* 436.

Saskatchawan, to the prairies of the Rocky Mountains, *Drummond!* Lake Huron, *Dr. Todd.* Borders of woods at Devil's Lake, *Mr. Nicollet!*

Grassy plains of the Platte, *Nuttall.*—Scape 1–2 feet high, 2–4 times dichotomous. Heads fastigiate, resembling those of C. biennis; from which this species is distinguished by its mostly naked and slightly pubescent scape, narrower and less scarious scales of the involucre, &c., as well as the much more entire leaves. Some states seem to approach the following species, so as only to be distinguished by the larger heads, and more or less pubescent involucre.

2. *C. glauca:* perennial, glabrous and glaucous throughout; leaves all radical, thickish, spatulate-oblong, or nearly lanceolate, mucronate or somewhat acuminate, tapering to the base, unequally runcinate-toothed or runcinate-pinnatifid, or some of the leaves entire; scape naked, twice or thrice dichotomous, with minute bracts at the divisions; scales of the proper involucre about 12, linear; the calyculate scales minute; achenia obscurely angled, smooth, slightly attenuated towards the apex, as long as the pappus.—Crepidium glaucum, *Nutt.! in trans. Amer. phil. soc. l. c.*

β. caulescens: not glaucous [?]; stem with a cauline leaf at the first division.—Crepidium caulescens, *Nutt. l. c.*

Plains of the Upper Platte, *Nuttall! Lieut. Fremont!* July–Aug.—Scapes about a foot high. Heads much smaller than in C. runcinata, about 30-flowered. Leaves 3–6 inches long, tapering into an indistinct or winged petiole. Achenia strongly striate-ribbed, smooth.

3. *C. occidentalis* (Nutt.): perennial? dwarf, canescent with a close furfuraceous pubescence; cauline leaves few, sessile, pinnately parted, with the linear or lanceolate lobes often somewhat toothed; the radical lanceolate, acute, runcinate-pinnatifid, tapering into a petiole; the short lobes toothed; heads (few) paniculate-corymbose; proper scales of the cylindrical involucre 8–10, linear-lanceolate, canescent, and sparsely hispid with blackish hairs intermixed; the calyculate scales few and very short; achenia fusiform, not angled or striate, as long as the pappus.—*Nutt.! in jour. acad. Philad.* 7. *p.* 29. Psilochæna occidentalis, *Nutt.! in trans. Amer. phil. soc. l. c.*

On the Oregon, near the Rocky Mountains, *Mr. Wyeth!* Plains of the Platte, *Nuttall!*—A span high. Heads as large as in C. runcinata, about 20-flowered. Achenia probably all fertile, tapering to the apex, not rostrate. Pappus grayish-white.

§ 2. *Involucre few-flowered, cylindrical; the exterior calyculate scales very short and appressed: receptacle naked: achenia slender,* 5–10-*striate.*—PHÆCASIUM, Cass., Reichenb. (Crepis § Leptotheca, *Nutt.*)

4. *C. nana* (Richards.): perennial, nearly acaulescent, depressed, very glabrous and glaucous; scapes numerous from the summit of the somewhat fusiform caudex, clustered, bearing one or more about 14-flowered heads, scarcely equalling the elliptical or roundish entire or sinuate-lyrate long-petioled leaves; achenia linear, narrowed at the apex, scarcely rostrate.—*Richards.! appx. Frankl. journ. ed.* 2. *p.* 92; *Hook.! appx. Parry's 2nd voy. p.* 397, *t.* 1, *& fl. Bor.-Am.* 1. *p.* 297. Hieracium, &c., *Gmel. fl. Sibir.* 2. *p.* 20, *t.* 7, *f.* 2 *&* 3. Prenanthes pygmæa, *Ledeb. in mem. acad. St. Petersb.* 5. *p.* 553. P. polymorpha, *Ledeb.! fl. Alt.* 4. *p.* 144. (*a. & β.*) Barkhausia nana, *DC.! prodr.* 7. *p.* 156.

From the Arctic coast and islands! to lat 64°, and on the northern Rocky Mountains! (Also in Arctic Siberia!)—Scapes and leaves an inch or two in height; the lamina of the inner leaves often oblong-linear. Corolla yellow, turning purplish in drying. Achenia all uniform, or the central perhaps a little longer than the marginal, 10-striate, a little constricted at the apex, and then dilated into a disk that bears the pappus; certainly none of them rostrate as in Barkhausia!

5. *C. elegans* (Hook.): perennial, very glabrous and glaucous; stems numerous from the same fusiform root, slender, paniculate, bearing numerous (small) 10–14-flowered heads; radical leaves oval or spatulate, petioled, nearly or quite entire; the cauline narrowly spatulate; the upper linear, sessile.—*Hook.! fl. Bor.-Am.* 1. *p.* 297; *DC.! prodr.* 7. *p.* 172. Barkhausia elegans, *Nutt. in trans. Amer. phil. soc. l. c. p.* 435.

On the Assiniboin River, *Drummond!*—Plant 6 inches high; with rather smaller heads than the preceding; the young achenia similar to those of that species, and not more rostrate.

6. *C. acuminata* (Nutt.): perennial; stem nearly glabrous, sparingly leafy, bearing numerous 8–10-flowered heads in a naked and fastigiate compound corymb; leaves pubescent, lanceolate; the radical runcinate-pinnatifid, tapering at the base into a petiole, and at the apex into a slender entire acumination; the cauline few and sessile; the uppermost narrowly linear, entire; calyculate involucral scales villous-pubescent when young.—*Nutt.! in trans. Amer. phil. soc. l. c. p.* 437.

Plains of the Platte, *Nuttall!*—Root long and fusiform. Scapiform stem a foot high. Radical leaves 4–5 inches long. Heads more slender than in C. nana; the young achenia, pappus, &c. similar.

193. TROXIMON. *Nutt. in Fras. cat.* 1813, *& gen.* 2. *p.* 127; not of *Gærtn.*

Agoseris, *Raf.* (excl. char.)—Ammogeton, *Schrad.*

Head many-flowered. Scales of the campanulate involucre ovate-lanceolate, acute or acuminate (distinct or nearly so), membranaceous, somewhat loosely imbricated in 2–3 series; the exterior sometimes shorter. Receptacle subalveolate, rarely with a few chaffy scales intermixed among the flowers! Achenia glabrous, oblong-linear, somewhat obcompressed, 10-ribbed, with a large basilar callus, more or less narrowed at the apex, but scarcely if at all rostrate. Pappus longer than the achenium, consisting of copious and unequal rather rigid white bristles, in several series, scarcely scabrous, the stronger ones gradually thickened towards the base, and frequently more or less flattened.—Perennial acaulescent herbs, with the aspect of Scorzonera (natives of the Upper Mississippi and Missouri, the interior of Oregon, Saskatchawan, &c.,); the naked simple scapes terminated by a large head. Root fusiform or thickened. Leaves linear or lanceolate, elongated, entire, denticulate, or rarely runcinate-pinnatifid. Flowers showy, yellow, sometimes changing to purple or rose-color when old or in drying.

We find a gradual transition from the typical species of Troximon to Macrorhynchus, to which genus this bears nearly the same relation that Crepis does to Barkhausia. Even the nature of the pappus fails to furnish a very marked distinction, although in Troximon it is more or less rigid. Indeed, were the genus founded on T. cuspidatum alone, it would inevitably be referred to the subtribe Scorzonereæ; for all the bristles of the pappus in that species are somewhat flattened and wider towards the base; the inner and stronger ones so much so that they should rather be termed *paleæ* than bristles. But this character is much less evident in the nearly allied T. glaucum; and in the other species the bristles are capillary, although rather stiff. The remaining Troximon of Gærtner proving a Scorzonera, the name should certainly be kept for the present genus.

1. *T. cuspidatum* (Pursh): somewhat tomentulose when young; leaves narrowly linear-lanceolate, attenuate-acuminate, somewhat nerved, especially

on the broad midrib; the often undulate margins tomentose; scales of the involucre somewhat scarious, lanceolate, cuspidate-acute, glabrous, in two nearly equal series, erect; bristles of the pappus very numerous, rigid; the inner and stronger series evidently flattened and dilated towards the base!—*Pursh, fl.* 2. *p.* 742. T. marginatum, *Nutt.! gen.* 2. *p.* 128, & *in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 433.

Plains of the Upper Missouri and Platte to the Rocky Mountains, *Bradbury! Nuttall! Mr. Nicollet!* Eagle Prairie, Wisconsin, *Mr. Lapham!* April–June.—Heads, &c., apparently rather smaller than in the following. Achenia manifestly obcompressed, obtusely ribbed, a little narrowed at the summit, but not at all rostrate, much shorter than the setose pappus.

2. *T. glaucum* (Nutt.): somewhat glaucous; leaves linear-lanceolate, acute, entire, or rarely with one or two small teeth (the broad midrib somewhat nervulate towards the base), and with the scape nearly glabrous; scales of the involucre loosely imbricated in 3–4 series, somewhat unequal; the exterior (green) ovate-lanceolate and more or less pubescent when young; bristles of the pappus capillary, rigid.—*Nutt.! in Fras. cat.* (1813), & *gen.* 2. *p.* 128; *Pursh, fl.* 2. *p.* 495 & 505; *Sims, bot. mag. t.* 1667; *Hook.! fl. Bor.-Am.* 1. *p.* 300. (var. *β.*)

β. dasycephalum: involucre woolly at least when young, the exterior scales spreading; leaves and scape often somewhat pubescent; receptacle sometimes, but not always, furnished with a few linear-acuminate chaffy scales intermixed among the flowers!—T. glaucum, *Richards.! appx. Frankl. journ. ed.* 2. *p.* 29; *DC. prodr.* 7. *p.* 252. T. glaucum, *a. Hook.! fl. Bor.-Am.* 1. *p.* 300; & *bot. mag. t.* 3462. T. pumilum, *Nutt. in trans. Amer. phil. soc. l. c.?* Ammogeton scorzoneræfolium, *Schrad.! ind. sem. Gœtt.* 1833; *DC.! prodr.* 7. *p.* 98.

Grassy plains of the Upper Missouri, *Bradbury, Nuttall! Dr. James*! and Big Sioux River, *Mr. Nicollet!* to Saskatchawan, *Drummond!* *β.* Saskatchawan and prairies of the Rocky Mountains to the Arctic coast, *Drummond! Richardson!* July–Aug.—Scape 6–12 inches high. Leaves 6–8 inches long, 4–10 lines wide. Heads nearly an inch in diameter. Tube of the bright yellow corolla beset with long jointed hairs near the summit. Achenia abruptly narrowed at the apex, obcompressed, at least when young.—It is remarkable that the chaff on the receptacle of the var. *β.* is found in some but not all of the wild specimens we have examined.

3. *T. parviflorum* (Nutt.): glabrous, or somewhat villous-pubescent when young; leaves narrowly lanceolate-linear, acute or acuminate, entire, sometimes retrorsely denticulate towards the base; scales of the glabrous involucre ovate-lanceolate, acuminate, few, in 2–3 series; the outer bracteolate, scarcely half the length of the inner; pappus capillary, rigid.—*Nutt.! in trans. Amer. phil. soc. l. c.*

Plains of the Platte to the Rocky Mountains, *Nuttall! Lieut. Fremont!*—Scape 4–5 inches high, mostly longer than the leaves: the latter about 2 lines wide. Head very much smaller and narrower than in the preceding; the flowers and involucral scales much fewer. Flowers yellow, sometimes changing to rose-color in drying.

4. *T. roseum* (Nutt.): leaves runcinate-pinnatifid, with short linear lobes, and with the scape sparsely villous-pubescent when young; scales of the glabrous involucre lanceolate, acuminate, few, in 2–3 series, the exterior short; pappus copious, capillary, rigid (flowers rose-color).—*Nutt.! in trans. Amer. phil. soc. l. c.*

Plains of the Platte, with the preceding, "which it wholly resembles, except the leaves and red [rose-color in spec. char.] flowers," *Nuttall!*—Achenia with 10 sharp ribs, rather shorter than the pappus, narrowed at the apex

into a somewhat distinct beak.—Probably not sufficiently distinct from the foregoing.

‡ *Uncertain species.*

5. *T. taraxacifolium* (Nutt.): somewhat hirsute; leaves lanceolate or oval-lanceolate, scarcely acute, incisely runcinate-toothed at the base; scales of the involucre in about 2 series, the inner linear; achenia 'rostrately attenuated.' *Nutt. in trans. Amer. phil. soc. l. c.*

Plains of the Wahlamet, Oregon.—Remarkable for its broad leaves, which are an inch and a quarter wide, by six inches in length, most pubescent on the midrib. Scape rather short. Pappus very long and coarse, minutely scabrous. *Nuttall.*

T. odoratum, Raf., and the other fictitious species of the Flora Ludoviciana, it would be quite useless to attempt to identify.

194. MACRORHYNCHUS. *Less. syn. p.* 139; *Fisch. & Meyer, ind. sem. St. Petersb.* 1835.; *DC. prodr.* 7. *p.* 145.

Macrorhynchium, *Reichenb.*—Trochoseris, *Pœpp. & Endl.*

Head many-flowered. Scales of the campanulate involucre imbricated in few series, lanceolate; the exterior often foliaceous, sometimes calyculate. Receptacle naked. Achenia mostly terete, or slightly obcompressed, linear or fusiform, about 10-ribbed or grooved, the ribs callous, corky, or alate, the apex at length produced into a long and slender or filiform beak. Pappus shorter than the achenium, consisting of copious uniform soft and white capillary bristles, minutely scabrous, often caducous.—Annual or perennial acaulescent or subcaulescent (American, chiefly Western,) herbs, with nearly the habit of Troximon. Leaves entire or laciniate-pinnatifid. Scapes simple, with solitary heads. Flowers yellow.

§ 1. *Perennial: ligules elongated: achenia fusiform, 10-ribbed or 10-nerved, glabrous (the outer series sometimes infertile, ex Nutt.); the ribs uniform, not winged or produced.*—STYLOPAPPUS, Nutt.

* *Scales of the campanulate involucre consimilar, in few series; the exterior often squarrose-spreading or calyculate.* (Stylopappus § Troximeria, *Nutt.*)

1. *M. troximoides:* glabrous, at least when old, acaulescent; leaves oblanceolate, mostly obtuse and entire (rarely with one or two small salient teeth), tapering into slender margined petioles; scales of the involucre lanceolate, appressed, in about 2 somewhat equal series, the exterior rather broader, woolly pubescent when young, as well as the summit of the elongated scape; achenia fusiform-linear, strongly and closely 10-sulcate, gradually attenuated into a beak which is nearly as long as the deciduous pappus, but shorter than the proper body of the achenium.—Troximon aurantiacum, *Hook.! fl. Bor.-Am.* 1. *p.* 300, *t.* 104; *DC. prodr.* 7. *p.* 252. T. pumilum, *Nutt.! in trans. Amer. phil. soc. l. c.?*

Alpine prairies of the Rocky Mountains, *Drummond!* On the Wind River Chain at the elevation of 7000 feet and more, *Lieut. Fremont!* Mount Ranier, Oregon, *Mr. Tolmie!*—Scape a span to a foot high. Corolla orange-

color.—We have described the fruit from the single specimen collected by Lieut. Fremont; which alone exhibits it fully developed. The slender terete achenium, with the beak, is nearly three-fourths of an inch long; and the apex, as in other species, is abruptly dilated into a flat disk for the insertion of the pappus, which is quite fugacious. In no case do we find the involucral scales united as in Hooker's figure.—This is possibly the Macrorhynchus aurantiacus, *Fisch. & Meyer*; a species of unknown origin: but it does not sufficiently accord with the brief character given by De Candolle.

2. *M. laciniatus:* nearly glabrous, at least when old, acaulescent; leaves narrowly linear, sparingly laciniate-toothed towards the base, or subpinnatifid; the lobes (1–3 on each side) linear, slender; scales of the involucre lanceolate, acute, imbricated in 3–4 series; the outer shorter and somewhat spreading, woolly-pubescent when young, as well as the summit of the scape; "stipe more than twice the length of the achenium."—Stylopappus (Troximeria) laciniatus, *Nutt.! in trans. Amer. phil. soc. l. c.*

β. longifolius: leaves more pubescent, deeply divided, slender; exterior scales of the involucre nearly equalling the inner, foliaceous, spreading.—Stylopappus laciniatus *β.* longifolius, *Nutt.! l. c.*

Plains of the Wahlamet, Oregon, *Nuttall!* Oregon, *Dr. Scouler!* (var. *β.*)—Plant 6–12 or 20 inches high. Heads nearly as large as in M. troximoides. Flowers pale yellow.

3. *M. elatus:* at length nearly glabrous, acaulescent; leaves sparingly and unequally pinnatifid, glaucous; the lobes and rachis narrowly linear-lanceolate; scape woolly when young; scales of the involucre hirsute, lanceolate, imbricated in 3 or 4 series, the exterior shorter; stipe rather longer than the slender achenium (marginal infertile? achenia minutely pubescent.)—Stylopappus (Troximeria) elatus, *Nutt.! in trans. Amer. phil. soc. l. c.*

On the Wahlamet, with the preceding, *Nuttall!*—Scape 1–2 feet high; sometimes with a single small leaf. Stipe of the achenium filiform.—Nearly allied to M. laciniatus.

4. *M. Lessingii* (Hook. & Arn.): root perennial; stem scapiform, glabrous; leaves glabrous, narrowly linear, pinnatifid, with segments short and remote (leaves either entire, toothed, or subpinnatifid, obtuse, elongated obovate, *DC.*); scales of the involucre rather obtuse, with scarious margins, somewhat hirsute; achenia fusiform, deeply 10-striate-sulcate, the ribs obtuse and not winged, one-third the length of the filiform beak (those of the outer and inner flowers similar); pappus soft, caducous. *Hook. & Arn. bot. Beechey, suppl. p.* 361. Borkhausia Lessingii, *Hook. & Arn. l. c. p.* 145. Troximon apargioides, *Less. in Linnæa*, 6. *p.* 501; *DC. prodr.* 7. *p.* 252.

California, *Chamisso, Capt. Beechey, Douglas.*—This plant is unknown to us. Lessing says it has the aspect of Krigia Virginica, or a state of Leontodon autumnale with a single head.

* * *Scales of the hemispherical involucre dissimilar; the exterior short, foliaceous, denticulate, squarrose-spreading.*

5. *M. grandiflorus:* pubescent or at length glabrous, acaulescent; leaves lanceolate, lyrately pinnatifid, tapering into long petioles; the terminal lobe large and oblong-lanceolate; scape stout, fistulous, striate, woolly at the base; exterior scales of the involucre ovate, obtuse, rather rigid, in 2–3 series, about half the length of the inner, which are narrowly lanceolate-linear, acute, somewhat scarious, as long as the pappus; achenia linear-oblong, acute at each end, 10-striate, about one-third the length of the setiform beak; pappus very soft and slender.—Stylopappus grandiflorus, *Nutt.! l. c.*

High plains of the Wahlamet, *Nuttall!*—Scape a foot high. Head larger than that of the Dandelion; only seen in fruit. Achenia very small for the

size of the head, 2–3 lines long (the exterior abortive, *Nutt.*); the capillary stipe twice the length of the very white pappus.

§ 2. *Annual: ligules elongated: achenia linear-oblong, glabrous, obtuse; the outer series inflated and scarcely striate; the others compressed* [*obcompressed?*], *with* 10 *acute narrowly winged ribs: scales of the involucre imbricated in few series, the exterior shorter and calyculate.*—CRYPTOPLEURA, Nutt.

6. *M. Californicus:* dwarf (3–4 inches high), subcaulescent, hirsute: leaves linear-lanceolate, incisely serrate; scales of the involucre in about 3 series; the outer ovate, acute, hirsute; the inner lanceolate; achenia about half the length of the filiform beak.—Cryptopleura Californica, *Nutt. in trans. Amer. phil. soc. l. c. p.* 431.

Near St. Barbara, California, *Nuttall.*—The achenia are said to be yellowish-white: the pappus very soft and white. We have not seen the plant, and have derived the character wholly from Nuttall's description.

§ 3. *Annual: ligules scarcely exserted: achenia* (*glabrous or nearly so*) *with the ribs callous-corky or winged: scales of the involucre in few series, appressed, or the exterior foliaceous and squarrose-spreading.*—MACRORHYNCHUS, Less., Fisch. & Meyer. (Trochoseris, *Pœpp. & Endl.* Kymapleura, *Nutt.*)

7. *M. hetrophyllus* (Nutt.): dwarf, subcaulescent, villous-pubescent when young; primary leaves oblanceolate or spatulate, mostly entire; the others sparingly pinnatifid, with 2–3 short linear lobes on each side; the terminal lobe elongated, oblong-linear; scape scarcely longer than the leaves; scales of the involucre lanceolate, appressed, in 2 series; the outer rather shorter and somewhat pubescent; achenia with slightly undulated wings, about one-third the length of the filiform beak.—M. (Kymapleura) heterophyllus, *Nutt.! mss., & trans. Amer. phil. soc. l. c. p.* 430. Kymapleura heterophylla, *Nutt. l. c.* (in errata.)

Plains of Oregon, *Nuttall!*—Plant 4–5 inches high, slender. Head small. Corolla pale yellow, purplish externally, fugacious.—This species appears to resemble M. Pœppigii. We do not observe any marked difference between the outer and inner achenia, or that either are at all compressed, or more than obscurely pubescent, and that only when quite young.

195. TARAXACUM. *Haller, enum. Helv.* (excl. spec.); *Juss.*; *DC. l. c.*

Head many-flowered. Involucre double; the exterior of small scales, either appressed, spreading, or reflexed; those of the inner erect, in a single series; all often callous-corniculate at the apex. Receptacle naked. Achenia oblong, striate-ribbed or angled, muricate on the ribs, the apex abruptly produced into a long beak. Pappus of copious white capillary bristles.—Acaulescent perennial herbs, with simple fistulous and naked scapes bearing a rather large head; the leaves all radical, oblong, or lanceolate, either nearly entire, sinuate-toothed, or runcinate. Flowers yellow.—*Dandelion.*

* *Exterior involucral scales spreading or squarrose.*

1. *T. Dens-leonis* (Desf.): at length glabrous; leaves unequally and acutely runcinate, the lobes toothed anteriorly; scales of the involucre not corniculate, the exterior reflexed; achenia muricate at the summit.—*DC.! prodr.* 7. *p.* 145. T. officinale, *Vill.*; *Koch, syn. fl. Germ. & Helv. p.* 428, var. *a.* Leontodon Taraxacum, *Linn.*; *Engl. bot. t.* 510; *Pursh, fl.* 2. *p.* 497; *Ell. sk.* 2. *p.* 250; *Hook.! fl. Bor.-Am.* 1. *p.* 296; *Darlingt.! fl. Cest. p.* 443.

Pastures, &c., naturalized nearly throughout the United States! Probably native in the Northern States, and throughout British America on both sides of the Rocky Mountains. *Hook.* April–Sept.—"When the heads of flowers first expand, the pappus is nearly sessile; as soon as the florets shrivel, the inner series of the involucre closes for a short time, in a cylindrical form; the beak of the achenia then becomes suddenly elongated, the whole involucre is reflexed, and the elevated pappus displayed in a globular head." *Darlingt.*—The following species (the characters of which we copy from chiefly De Candolle, who keeps them distinct), as well as nearly all the genuine Taraxaca, are not improbably correctly viewed by Fries, Koch, and other excellent botanists, as mere varieties of this, the *Common Dandelion.*

2. *T. latilobum* (DC.): leaves runcinate, glabrous above, sparsely hairy (especially on the midrib) beneath; the lobes broadly triangular, toothed anteriorly, crowded; scape glabrous; scales of the involucre not corniculate; the exterior reflexed-spreading; achenia muricate throughout. *DC.! l. c.*

Newfoundland, *Pylaie!*—Very [too] near T. Dens-leonis. *DC.*

3. *T. ceratophorum* (DC.): leaves glabrous, sinuate-toothed or runcinate; scapes glabrous, when young tomentose at the apex; scales of the involucre all erect, furnished with a callous horn below the apex; achenia mucronate at the apex, as long as the beak. *DC. l. c.*—Leontodon ceratophorum, *Ledeb. fl. Alt.* 4. *p.* 149, & *ic. pl. Ross.-Alt.* 1. *t.* 34.

Unalaschka (and Kamtschatka).—Lobes of the leaves various in size; the larger triangulate. Head twice as large as that of T. Dens-leonis. *DC.*

* * *Exterior involucral scales appressed.*

4. *T. palustre* (DC.): glabrous; leaves lanceolate, sinuate or somewhat runcinate, as long as the scape; scales of the involucre not corniculate; the exterior lanceolate, acute; achenia spinellose-muricate at the apex, one-half or one-third the length of the beak. *DC.! fl. Fr., & prodr. l. c.*—Leontodon palustre, *Smith, fl. Brit.* 2. *p.* 823; *Engl. bot. t.* 553; *Hook.! fl. Bor.-Am.* 1. *p.* 296. L. Taraxacum *β.* salinum, *E. Meyer, pl. Labrad. p.* 58. Taraxacum montanum, *Nutt.! in trans. Amer. phil. soc. l. c. p.* 430, not of *DC.*

British America! from Labrador and Hudson's Bay to the Pacific. Also among the Rocky Mountains, in somewhat saline situations on the Platte, and in the highest vallies of the Colorado of the West. *Nuttall!*—Varies greatly as to the shape and toothing of the leaves.

5. *T. hirsutum* (Hook.): hirsute throughout; leaves pinnatifid; the unequal lobes acuminate, remote; scales of the involucre erect, appressed, clothed with fulvous hairs. *Hook.! fl. Bor.-Am.* 1. *p.* 296 (under Leontodon); *DC. l. c. p.* 149.

Menzies' Island, and sandy banks of the Oregon, *Douglas, Dr. Scouler.*

196. PYRRHOPAPPUS. *DC. prodr.* 7. *p.* 144.

Heads many-flowered. Involucre double; the exterior of numerous linear-subulate mostly loose and spreading scales; the interior of numerous erect linear scales, in a single series, often somewhat corniculate near the apex, their margins usually more or less united. Receptacle flat, naked. Achenia oblong, somewhat terete, 5-sulcate, minutely scabrous, muricate, or rugulose; the apex at length produced into a long beak. Pappus of copious and very soft capillary (scarcely scabrous) bristles, either reddish or fulvous.—Perennial? or perhaps mostly annual or biennial nearly glabrous herbs (natives of the Southern United States and Mexico, except a doubtful Cape species); with oblong or lanceolate often pinnatifid or laciniate leaves; the simple or branching stems naked at the summit and bearing rather large heads. Flowers deep yellow.

1. *P. Carolinianus* (DC.! l. c.): stem simple or mostly branched above; earliest radical leaves lanceolate-oblong, obtuse, sinuate-toothed or nearly entire; the others lanceolate, acute, mostly laciniate or pinnatifid; scales of the inner involucre somewhat corniculate near the apex, slightly caulescent, like the apex of the peduncle, with a minute furfuraceous pubescence; achenia minutely rugulose transversely when mature, much shorter than the filiform beak, which is furnished with a villous ring immediately at the base of the fulvous or at length reddish pappus.—*Nutt.! in trans. Amer. phil. soc. l. c. p.* 430 (*β.* maximus). Leontodon Carolinianum, *Walt. Car. p.* 192. Scorzonera pinnatifida, *Michx.! fl.* 2. *p.* 89. Chondrilla lævigata, *Pursh, fl.* 2. *p.* 497. Borkhausia Caroliniana, *Nutt. gen.* 2. *p.* 126; *Ell.! sk.* 2. *p.* 251; *Hook.! in compan. to bot. mag.* 1. *p.* 100. (*α.* & *β.*)

Fields, &c., Maryland! and Virginia! to Louisiana! and Arkansas! common. March–July.—① or 2f? Stem often scapiform, with only one or two partly clasping leaves, sometimes a little pubescent at the base. Flowers showy.—De Candolle, describing from immature specimens, states that the achenium has a short beak; but when mature it is remarkably long, as described by Elliott.

2. *P. grandiflorus* (Nutt.): scape simple, naked, much longer than the deeply pinnatifid and ciliate radical leaves, bearing a single head; involucre slightly canescent; pappus fulvous, furnished with a villous ring at the base.—*Nutt.! in trans. Amer. phil. soc. l. c.* P. scaposus, *DC. l. c.?* Borkhausia grandiflora, *Nutt.! in jour. acad. Philad.* 7. *p.* 69.

Borders of shaded ravines, &c., Arkansas, *Dr. Pitcher!* May.—Root slender, apparently annual. Earlier radical leaves runcinate-toothed or subpinnatifid; the succeeding larger (4–6 inches long) deeply pinnatifid, with the lobes linear-oblong, sparingly angulate-toothed, divaricate or spreading. Scape a foot high, with a single small bract in the middle. Head larger than in the preceding; the flowers golden yellow. Achenia not seen. Ovary with a short beak.

197. LACTUCA. *Tourn. inst. t.* 267; *Linn.*; *Gærtn. fr. t.* 158; *DC. l. c.*

Heads several–few-flowered. Scales of the cylindrical calyculate-imbricated involucre in 2–4 series; the exterior shorter. Receptacle naked.

Achenia obcompressed, flat, wingless, glabrous, abruptly produced into a filiform beak. Pappus of copious very soft and white capillary bristles in several series, fugacious.—Caulescent herbs (chiefly of the northern hemisphere); with entire or pinnatifid leaves, and paniculate heads. Flowers yellow, blue, purple, or white, often variable in the same species.

In all the following species, the heads are about 20-flowered; and the achenia brownish or blackish, very obscurely scabrous-rugulose, one-nerved in the middle of each face, and sometimes with two obsolete nerves towards the margin. Nuttall places them all in his GALATHENIUM; but we cannot comprehend how this portion of the proposed genus is to be distinguished from Lactuca, nor the remainder from Mulgedium; nor why the author did not refer to it his own Mulgedium pulchellum, which is exactly intermediate between Mulgedium and Lactuca.

1. *L. graminifolia* (Michx.): stem simple, virgate; leaves elongated, sessile; the cauline narrowly linear, acute, entire; the lowest and radical sparingly runcinate-pinnatifid or toothed in the middle, linear and elongated towards the base and apex; heads in a narrow loose and leafless panicle; achenia elliptical, rather longer than the beak; flowers purple, varying to white, or yellow!—*Michx.! fl.* 2. *p.* 85; *Ell. sk.* 2. *p.* 253; *Hook.! compan. to bot. mag.* 1. *p.* 100; *DC. prodr.* 7. *p.* 134. L. graminea, *Spreng. syst.* 3. *p.* 659. Galathenium graminifolium, *Nutt. in trans. Amer. phil. soc. l. c.* 7. *p.* 443. G. salicifolium, *Nutt.! l. c.* as to the spec. "Florida, *Ware*," *in herb. acad. Philad.*

α. glabrous, or the midrib of the lower leaves often sparingly hirsute.

β. lower leaves and base of the stem hirsute.

Dry soil, South Carolina to Alabama! and Western Louisiana! April–Sept.—② or 4? Stem 2–3 feet high, slender. Lower leaves 6–10 inches long, 3–6 lines wide; the radical usually with one or 2 pairs of runcinate lobes.

2. *L. elongata* (Muhl.): stem tall and stout, simple or paniculate at the summit; leaves partly clasping, pale beneath, the upper usually lanceolate and entire; the lower runcinate-pinnatifid; heads in an elongated leafless panicle; achenia oval, rather longer than the beak; flowers light yellow, varying to purple.

α. longifolia: glabrous or nearly so; upper leaves elongated lanceolate and often entire; the lower runcinate-pinnatifid, with the lobes lanceolate, acute or acuminate, entire or slightly repand-toothed; the terminal lobe elongated; flowers mostly light yellow.—L. longifolia, *Michx.! fl.* 2. *p.* 85. L. elongata, *Muhl. in Willd. spec.* 3. *p.* 1523; *Pursh, fl.* 2. *p.* 500; *Ell.! sk.* 2. *p.* 252; *Hook.! fl. Bor.-Am.* 1. *p.* 296; *Darlingt.! fl. Cest. p.* 442; *DC.! prodr.* 7. *p.* 137. L. Caroliniana, *Walt. Car. p.* 193? Galathenium elongatum, *Nutt.! l. c.*

β. integrifolia: glabrous; leaves all or nearly all undivided, lanceolate, acute or acuminate, entire or repand-denticulate; the lowest occasionally pinnatifid; flowers light yellow, ochroleucous, tinged with purple, or bluish-purple.—L. integrifolia, *Bigel.! fl. Bost. ed.* 2. *p.* 287; *DC. prodr.* 7. *p.* 137, not of *Nutt.* L. sagittifolia, *Ell.! sk.* 2. *p.* 253; *DC. l. c.* Galathenium integrifolium, *Nutt. l. c.* G. salicifolium, *Nutt.! l. c.*, as to Pennsyl. specim. herb. Schweinitz.

γ. sanguinea: smaller; leaves all or nearly all runcinate; mostly hirsute-pubescent (as well as the stem) either throughout or on the midrib beneath; the lobes usually shorter and broader, irregularly toothed, the terminal one not prolonged; flowers yellow-purple (*Muhl. mss.*), dark-red with a yellowish centre (*Oakes, mss.*), saffron-color, or purple (branches and involucre often purplish).—L. hirsuta, *Muhl. cat.*; *Nutt. gen.* 2. *p.* 124.

L. villosa, *Muhl. fl. Lancastr. ined.* L. sanguinea, *Bigel.! fl. Bost. ed.* 2. *p.* 134; *DC. l. c.* Galathenium sanguineum, *Nutt.! in trans. Amer. phil. soc. l. c.* G. Floridanum, *Nutt.! l. c.*, fide *herb. acad. Philad.*

ε. *albiflora:* glabrous, "flowers white"; otherwise as in var. γ.

Rich damp soils, fields and borders of thickets, Canada! and Saskatchawan! to Georgia! and Louisiana! γ. Massachusetts! and Upper Mississippi! to Louisiana! and Texas! in more exposed places and sterile soil. δ. Western Louisiana, *Dr. Hale!* July–Aug.—②? Stem 2–8 feet high, hollow. Leaves mostly large, very variable; all the above varieties passing into each other.—*Wild Lettuce. Fire-weed.*

‡ *Doubtful species.*

3. *L. Ludoviciana* (DC. l. c.): very smooth (3–5 feet high); leaves all runcinate, retrorsely and sharply toothed; the cauline partly clasping; panicle divaricate, the peduncles and involucre naked; pappus conspicuously stipitate; flowers yellow, *Nutt.*—Sonchus Ludovicianus, *Nutt. gen.* 2. *p.* 125. Galathenium Ludovicianum, *Nutt. in trans. Amer. phil. soc.*, as to syn.

Moist places in the open plains around Fort Mandan on the Missouri, *Nuttall.* June.—This is entirely unknown to us. May it not be a state of the polymorphous Lactuca elongata? But a specimen in the herbarium of the Academy of Natural Sciences at Philadelphia (New Orleans, *Mr. Trudeau!*) ticketed by Mr. Nuttall 'Mulgedium Ludovicianum', is M. Floridanum, wanting the lower leaves.

L. Canadensis (Linn. l. c.), as to the description, and especially as regards the syn. "L. Canadensis altissima angustifolia, flore pallide luteo." *Tourn. inst. p.* 474, (which is perhaps the foundation of the species) probably relates to the common Lactuca elongata; to which, indeed, the very imperfect specimen in the Linnæan herbarium may belong, although it is marked by Smith as a Sonchus.

198. MULGEDIUM. *Cass. dict.* 33 (1824), *p.* 296; *Less. syn. p.* 142; *DC.*

Agathyrsus, *Don* (1829).

Heads many-flowered. Involucre calyculate-imbricated; that is, with the exterior scales much shorter than the others and more or less imbricated. Receptacle naked, foveolate. Achenia glabrous, compressed, striate with a few nerves or ribs on each side, the summit contracted into a more or less evident thickish beak of the same texture with the body of the achenium, which is expanded at the apex into a ciliate disk. Pappus of copious somewhat scabrous capillary bristles in one or more series, rather soft and deciduous, either bright white or tawny.—Caulescent herbs (mostly of the northern hemisphere); with pinnatifid or undivided leaves, and racemose or usually paniculate heads. Flowers blue, rarely dull bluish-white or ochroleucous.

§ 1. *Pappus bright white: corolla blue or purple.*—EUMULGEDIUM, DC.

* *Achenia tapering into a slender beak: involucre imbricated.*

1. *M. pulchellum* (Nutt.): glabrous, pale or glaucescent; stem simple or sparingly branched; leaves oblong-lanceolate or linear, sessile, mucronate, entire, or lower runcinate-pinnatifid; heads several, racemose-corymbose; the erect peduncles furnished with subulate scale-like bracteoles; scales of

the conoid-cylindraceous involucre lanceolate, imbricated in 3–4 series; achenia minutely scabrous, lanceolate-oblong, tapering into a conspicuous beak.—M. pulchellum & M. heterophyllum, *Nutt.! in trans. Amer. phil. soc.* (*n. ser.*) 7. *p.* 441. Sonchus pulchellus, *Pursh! fl.* 2. *p.* 502. S. Sibiricus, *Richards.! appx. Frankl. journ. ed.* 2. *p.* 30; *Hook.! fl. Bor.-Am.* 1. *p.* 293; not of *Linn.* (at least as to the Siberian plant.) Lactuca integrifolia, *Nutt.! gen.* 2. *p.* 124, not of *Bigel.* (L. oblongifolia, *Nutt.! in Fras. cat.*) L. pulchella, *DC. prodr.* 7. *p.* 134.

α. leaves entire, or the lower occasionally 1–2-toothed towards the base, varying from lanceolate-oblong to narrowly linear.

β. lower and sometimes nearly all the cauline leaves runcinate-pinnatifid; the lobes oblong-lanceolate, entire.

Alluvial soil, &c., from the Upper Missouri and Platte, *Nuttall! Mr. Nicollet! Lieut. Fremont!* and Lake Huron (*Dr. Todd*), north to Fort Franklin, in lat. 66°, *Richardson! Drummond!* and west to the mouth of the Oregon, *Douglas! Mr. Tolmie! Nuttall!* July–Aug.—♃ A foot or more high, with pretty large heads (the involucre mostly tinged with purple), and showy bright blue flowers.—This plant, in some of its forms, has very much the aspect of M. Sibiricum; from which it is distinguished by the leaves being neither acuminate, nor dilated at the base (except the uppermost) or clasping, by the more imbricated involucre, and especially by the achenium, which tapers gradually into a prominent beak, the apex of which seldom presents the firm texture of the body of the fruit. The var. *β.* is also quite as nearly allied to M. Tartaricum; the achenium of which is unknown to us.

* * *Achenia with a short and thick or obscure beak: involucre calyculate-imbricated.*

2. *M. acuminatum* (DC.! l. c.): glabrous; stem paniculate at the summit; cauline leaves ovate or ovate-lanceolate, acuminate, denticulate or toothed, usually somewhat pubescent or hairy on the midrib and veiny beneath, contracted at the base into a winged petiole; the radical rarely sinuate or slightly runcinate; heads in a loose panicle, on short divaricate and somewhat bracteolate peduncles; involucre glabrous; achenia slightly rostrate.—Sonchus acuminatus, *Willd.! spec.* 3. *p.* 1521; *Pursh, fl.* 2. *p.* 502; *Ell.! sk.* 2. *p.* 255; *Torr.! compend. p.* 279; *Darlingt.! fl. Cest. p.* 446. S. Floridanus, *Michx.! fl.* 2. *p.* 85, in part. Lactuca villosa, *Jacq. hort. Schœnb.* 3. *t.* 367; *Beck. bot. p.* 170.

Borders of thickets, &c. New York! to Ohio! Kentucky! Georgia! and Alabama! Aug.–Sept.—② Stem 3–6 feet high, often purplish. Leaves 3–6 inches long, thin; the radical and sometimes the lower cauline truncate at the base. Flowers blue or purplish-blue. Heads small, nearly as in the following species; from which the undivided leaves chiefly distinguish it.

3. *M. Floridanum* (DC.! l. c.): glabrous; stem paniculate above; leaves lyrately or somewhat runcinately pinnately parted, with the segments sinuately or sharply toothed, the terminal usually triangular and acute or acuminate; the lower leaves petioled, often with small segments interposed; the uppermost sessile, lanceolate, sinuate-lobed or toothed; heads in a loose compound panicle, on divaricate slightly bracteolate peduncles; involucre glabrous; achenia with a short beak.—M. lyratum, *Cass. dict. l. c.* 33. *p.* 297. M. divaricatum, *Nutt. in trans. Amer. phil. soc. l. c. p.* 442. Chondrilla sylvestris alta, &c., *Clayt.! in Gronov. fl. Virg. p.* 115. Sonchus Floridanus, *Linn.! spec.* 2. *p.* 795; *Willd.! spec.* 3. *p.* 1520; *Michx.! fl.* 2. *p.* 85 (in part); *Pursh, fl.* 2. *p.* 501; *Ell. sk.* 2. *p.* 225. S. Lapponicus, *Willd. l. c.?* (excl. syn. & habitat.) S. biennis, *Mœnch.* S. leucophæus, *Hook.! compan. to bot. mag.* 1. *p.* 100. Lactuca Floridana, *Gærtn. fr. t.* 158. Agathyrsus Floridanus, *Beck, l. c.* (quoad syn.) Galathenium Floridanum, *Nutt. in trans. Amer. phil. soc. l. c.*

β. leaves somewhat sessile, or the upper cordate-clasping.—M. multiflorum, *DC. l. c.* Sonchus racemosus, *Lam. dict.*, ex *DC.* S. multiflorus, *Desf. cat. Par.* (1829). *p.* 145. Galathenium multiflorum, *Nutt. l. c.*

γ. achenia very obscurely rostrate; otherwise as in the ordinary plant.

δ. lower leaves with one or two narrow and often elongated lobes on each side; the terminal large and triangular-hastate, rarely hastately 3-lobed.

In rather rich soil, Southern and Western States! β. Mountains of the Southern States, *Rafinesque! Herb. Schweinitz! &c.* from Virginia! and Ohio! to Florida, Louisiana! and Texas! γ. Indiana, *Dr. Clapp!* δ. Ohio, *Mr. Lea!* North Carolina, *Mr. Curtis!* Tennessee, *Rafinesque!* July–Sept.— 4 or ②? Stem 3–6 feet high; the summit and loose branches often purplish and a little glaucous. Lower leaves large, variable in form; the terminal lobe often smallest. Heads as large, or rather larger than in M. leucophæum. Involucre calyculate-imbricate, often tinged with purple. Flowers blue.

§ 2. *Pappus tawny: corolla light blue, or ochroleucous.*—AGALMA, DC.

4. *M. leucophæum* (DC.! l. c.): glabrous or nearly so; stem tall, very leafy, paniculate at the summit; leaves irregularly subruncinate-pinnatifid or pinnately parted, coarsely and unequally toothed, often sparsely ciliate and hairy on the veins beneath; the uppermost often undivided, lanceolate-acuminate; heads in an ample compound panicle; peduncles racemose, subulate-bracteolate; involucre glabrous; flowers bluish-white or ochroleucous, usually changing to a pale dirty blue; achenia slightly rostrate.—Sonchus alpinus, *Linn.! spec.*, as to spec. char. only; *Smith! ic. pl. rar. t.* 21. S. Canadensis, *Linn. l. c.*, as to the habitat (the whole char. and descr. relating to the European S. alpinus). S. spicatus, *Lam. dict.* 3. *p.* 401. S. leucophæus, *Willd.! spec.* 3. *p.* 1520 (excl. syn. *Walt.*); *Pursh*, *fl.* 2. *p.* 501; *Desf.! cat. Par.*; *Hook.! fl. Bor.-Am.* 1. *p.* 293. S. acuminatus, *Bigel. fl. Bost.* S. Floridanus, *Ait.! Kew.* 3. *p.* 116; *Darlingt.! fl. Cest. p.* 445. S. pallidus, (*Pursh?*) *Torr.! compend. p.* 279. Lactuca Canadensis, &c., flore leucophæo, *Tourn. inst. p.* 474. L. Canadensis, *Linn. spec.* 2. *p.* 796? Agathyrsus leucophæus, *Don*; *Beck, bot. p.* 170. Mulgedium (Leucomela) leucophæum, *Nutt.! in trans. Amer. phil. soc. l. c. p.* 442.

β. *integrifolia:* leaves obovate-oblong or lanceolate, undivided, or the lower sparingly runcinate-pinnatifid, or incised.

Low grounds, &c., Saskatchawan! Newfoundland! Canada! Massachusetts! and throughout the Northern and Western States! to the mountains of Carolina! Also Oregon, *Dr. Scouler!* Aug.–Sept.—② Plant 3–12 feet high. Lower leaves often a foot long; the upper sessile, and usually partly clasping. Heads small. Pappus dirty white or tawny-brownish.—To the synonyms of this well-marked plant, perhaps we should add that of Sonchus macrophyllus, of American writers.

‡ *Of uncertain origin.*

5. *M. macrophyllum* (DC.! l. c.): stem strict, hispid at the summit; leaves ample, cordate at the base, somewhat lyrate, hairy beneath, the terminal lobe very large and cordate; panicle loose, hispid; involucre sparingly hispid. *DC.*—Sonchus macrophyllus, *Willd.! spec.* 3. *p.* 1519. (excl. syn. *Gronov.*) "S. Canadensis, *Frœl. in Ust. ann.* 1. *p.* 29." S. cordifolius, *Desf. cat. Par.* (1804) *p.* 87.

"North America.—Root tuberous. Stem 4–7 feet high. Flowers blue, as large as in the common Succory." *Willd.*—This well-marked species was founded on specimens cultivated in the Berlin Botanic Garden; the origin of which is no-where recorded. We have seen nothing like it in this country,

and are somewhat confident that it is not a native of North America. We have no conception what plant (if any) Pursh had in view, under this name, which is said to grow in shady low grounds, near springs, from Pennsylvania to Carolina."

M. alpinum, Less., should be excluded from the North American Flora; the real Sonchus alpinus, in fact, having never been found in Canada, nor the S. alpinus, *Smith, ic. pl. t.* 21, in Lapland or any part of Europe. The history of the confusion respecting S. alpinus and S. Canadensis produced by Linnæus, is evidently as follows. The specimens of the European S. alpinus and of a Canadian plant received from Kalm were transposed in the Linnæan herbarium; where the former (which was well described in the Lachesis Lapponica and the Hortus Cliffortianus long before the latter was known to botanists) is ticketed "S. Canadensis (K)," and the latter, (which is S. leucophæus, *Willd.*) "S. alpinus." Not perceiving this mistake, Linnæus, in the Species Plantarum, constructed the specific phrase of S. alpinus from the Canadian plant so ticketed in his herbarium (while all the synonymy and the habitat relate to the alpine European species); and at the same time gave an excellent description of the species he had himself collected in Lapland, under the name of S. Canadensis. Smith, on obtaining possession of the Linnæan herbarium, not duly considering Linnæus's description in the Hortus Cliffortianus, nor his detailed account of the Lapland plant in the then manuscript Lachesis Lapponica, incautiously figured the American specimen as the original Sonchus alpinus; and took the European species (which he afterwards named S. cœruleus) to be also a native of Canada. Hence, although the synonymy has long since been rectified, so far as relates to the European S. alpinus, that species also has ever since been erroneously viewed as an American plant.

199. SONCHUS. *Linn.* (excl. spec.); *Cass.; DC. prodr.* 7. *p.* 184.

Heads many-flowered, becoming tumid at the base. Involucre more or less imbricated. Receptacle naked. Achenia compressed, longitudinally ribbed or striate, not rostrate or attenuated at the apex. Pappus of copious very white exceedingly soft and fine capillary bristles, in several series.—Chiefly caulescent weed-like herbs (scarcely any of which are natives of this country); with undivided or pinnatifid leaves, and often corymbose or umbellate heads. Flowers yellow.

* *Annual herbs.*

1. *S. tenerrimus* (Linn.): stem erect, terete, glabrous, or with glandular hairs near the summit; leaves auriculate-clasping, variously 1–2-pinnately parted; the base of the involucre tomentose when young or at length naked; achenia narrow, nervulate, transversely tuberculate-rugose. *DC.—Linn. spec.* 2. *p.* 794; *Sibth. fl. Græc. t.* 790; *Boiss.! voy. bot. p.* 390. S. tenerrimus & S. pectinatus, *DC. prodr.* 7. *p.* 186, fide *Boiss.* S. tenuifolius, *Nutt.! in trans. Amer. phil. soc. l. c. p.* 438.

St. Diego, California, *Nuttall!*—The plant of Mr. Nuttall is said to grow in shady ravines among rocks, around St. Diego: but as the specimens wholly accord with slender states of S. tenerrimus (with the segments of the leaves chiefly linear; the involucre at length glabrous, or with a few glanduliferous hairs), we suppose it was introduced from Spain, among other weeds.

2. *S. oleraceus* (Linn.): glabrous, or the branches glandular hairy near the summit; cauline leaves runcinate-pinnatifid or rarely undivided, subspinulose-toothed, cordate-clasping, the auricles acute or acuminate; involucre and umbellate-corymbose peduncles (woolly when young) at length nearly glabrous; achenia striate, transversely rugose!—*Linn. spec.* 2. *p.* 794, var. lævis (*α.* & *β.*); *Fl. Dan. t.* 682; *Engl. bot. t.* 843; (*Ell. sk.* 2. *p.* 254?

Bigel. fl. Bost. ed. 2. *p.* 292?); *Hook.! fl. Bor.-Am.* 1. *p.* 292 (partly); *Koch, fl. Germ. & Helv. p.* 433. S. ciliatus, *Lam. fl. Fr.* 2. *p.* 87; *DC. prodr.* 7. *p.* 185. S. asper, *Gærtn. fr.* 2. *t.* 158; not of *Vill.* S. lævis, *Vill. Delph.* 3. *p.* 158.

Waste places, around gardens &c., introduced from Europe, and more or less naturalized in the United States! extending north to the Saskatchawan! and Newfoundland. Aug.–Sept.—Leaves more commonly divided, and the teeth less spinulose than in the following species. Flowers pale yellow. Achenia roughish or somewhat muricately rugose.—The distinguishing characters of this species not having been noticed by American writers, we are uncertain what synonyms are to be here adduced.—*Sow-Thistle.*

3. *S. asper* (Vill.): glabrous, or rather glandular-hairy at the summit; cauline leaves undivided, undulate, or slightly runcinate, conspicuously spinulose-toothed, cordate-clasping, with the auricles rounded; the upper lanceolate or oblong; the lower oval or spatulate, with a slender tapering base or winged petiole; involucre and umbellate-corymbose peduncles glabrous or slightly hairy; achenia margined, 3-nerved on each side, margined, smooth! (or the margins minutely serrulate-scabrous.)—*Vill. Delph. l. c.; Fuchs, hist.; Fl. Dan. t.* 893; *Reichenb. fl. excur.* 1. *p.* 274; *Koch, l. c.* S. oleraceus, var. asper, (*γ.* & *δ.*) *Linn. l. c.; DC. fl. Fr.; Borrer, in Engl. bot. suppl. t.* 2765 & 2766. S. oleraceus, var. spinulosus, *Oakes! cat. Vermont pl., in Thompson's gazetteer.* S. spinosus, *Lam. fl. Fr.*, not of *DC.* S. fallax, *Wallroth, sched. crit. p.* 432; *DC. prodr.* 7. *p.* 185. S. Carolinianus, *Walt. Car. p.* 192; *Ell.! sk.* 2. *p.* 255; *DC.! l. c.* S. spinulosus, *Bigel.! fl. Bost. ed.* 2. *p.* 292; *Darlingt.! fl. Cest. p.* 445; *DC. l. c.*

β. achenia more distinctly margined.—S. oleraceus, *Hook. & Arn. bot. Beechey, p.* 145; *Hook.! fl. Bor.-Am. l. c.*, as to Oregon plant. S. fallax? *β.* Californicus, *Nutt. in trans. Amer. phil. soc. l. c. p.* 438.

Fields and waste places, in rich damp soil throughout the United States! Probably indigenous to this country, at least in the south: now found in almost every part of the world. *β.* Oregon, *Dr. Scouler!* California, *Nuttall, &c.* Aug.–Sept., or in the Southern States, March–May.—Usually a smaller and more rigid plant than S. oleraceus. Flowers pale yellow.—*Sow-Thistle.*

* * *Perennial herbs.*

4. *S. arvensis* (Linn.): root creeping; stem erect, glabrous; leaves runcinate-pinnatifid, spinellose-toothed, cordate-clasping at the base, the auricles short and obtuse; panicle umbellate-corymbose; the pedicels and involucre hispid; achenia somewhat tetragonal, the ribs transversely rugulose. *DC. l. c.* —*Fl. Dan. t.* 606; *Engl. bot. t.* 674; *Pursh, fl.* 2. *p.* 501; *Beck, bot. p.* 171; *Hook. fl. Bor.-Am.* 1. *p.* 292. S. palustris, *Muhl. cat. p.* 73?

Newfoundland, *Hooker.* Essex County, Massachusetts, *Mr. Oakes!* Shores of Staten Island, New York, and the adjacent part of New Jersey, where it is perfectly naturalized! Pennsylvania, *Pursh;* in cultivated grounds and among rubbish; introduced from Europe. Aug.–Sept.—Heads large: flowers bright yellow.

S. pallidus (Willd. spec.) is a nominal species, wholly founded on the characters of Lactuca Canadensis of Linnæus and Tournefort, which afford no reason for deeming the plant either a Sonchus or a Mulgedium. Willdenow does not pretend to know the species, and it is mere pretence on the part of Pursh to speak of it as a common plant in Canada and New England.

ADDITIONS TO COMPOSITÆ.

LIATRIS, *p.* 67.

7 (*a*). *L. Chapmanii:* minutely cinereous-pubescent or nearly glabrous; stem rigid, very leafy; leaves strongly punctate, linear, rather obtuse, tapering to the base; the upper very short, the lowermost elongated; spike virgate, dense; the nearly sessile heads closely appressed, longer than the bracts, mostly 3-flowered; scales of the involucre (about 8), oblong, acute or mucronulate, appressed, resinous-punctate, shorter than the pappus, the outer very short; achenia villous-canescent; pappus rigid, plumose-barbellate towards the base.

Sand hills of Middle Florida, *Dr. Chapman!* Sept.—A foot or more in height; the cauline leaves, except the lowest, seldom more than an inch long, scarcely a line wide, broadest near the apex, usually spreading. Spike 4–10 inches long. Scales of the involucre often tinged with purple, obtuse and mucronulate, or acute, the margins very slightly if at all scarious. Flowers, and especially the pappus, large for the size of the heads; the latter composed of about 30 stiff bristles, fully as long as in L. cylindracea, very much longer than the achenia, densely barbellate towards the base, but scarcely more than denticulate at the apex.—This well-marked species belongs to the same subdivision as L. punctata, and has fully as large flowers; but the pappus is scarcely more plumose than in L. secunda.

10. *L. graminifolia*, *δ*. (L. dubia, *Barton! l. c.*) Add syn. L. propinqua, *Hook. bot. mag. t.* 2829.—If admitted as a species, the anterior name imposed by Barton must be retained.

EUPATORIUM, *p.* 81.

E. variifolium, Bartl. (*Ind. sem. hort. Gætt.* 1840; *Linnæa*, 15, *suppl. p.* 93) appears to be only a state of E. cannabinum, and to have been mistakenly considered as of American origin.—A form of A. cannabinum was cultivated in the Berlin Botanic Garden in the year 1839, under the erroneous name of E. trifoliatum.

E. Engelmannianum, Link, proposed in *Ind. sem. hort. Berol.* 1840, is founded on a plant raised from seeds sent from this country by Dr. Engelmann: but we have not yet seen the description.

ASTER, *p.* 103.

10 (*a*). *A. eryngiifolius:* stem simple, hirsute, leafy to the summit, bearing solitary or very few heads; leaves rigid, erect, glabrous, narrowly linear-lanceolate, pungently acute, 1–3-nerved, with cartilaginous margins, sparsely spinulose-serrate, or rarely entire; the radical attenuate at the base; the upper successively shorter, partly clasping; scales of the hemispherical involucre numerous, nearly equal, lanceolate, foliaceous, rigid, with mucronate or cuspidate mostly squarrose tips; rays numerous (white!); achenia glabrous.—Prionopsis? Chapmanii, *of this work*, *p.* 245.

As the rays of this plant prove to be white instead of yellow, we now remove it to its proper station next to Aster paludosus, with which it well accords in aspect, in the pappus, &c.; and from which its somewhat spinulose leaves and white rays abundantly distinguish it.

14. *A. adscendens* (Lindl.)—Wind River Chain of the Rocky Mountains, above 7000 feet, *Lieut. Fremont!* Var. *a*, and

δ. *Fremontii:* stem leafy, simple, bearing one or two heads; leaves thin; the cauline mostly oblong-lanceolate; exterior herbaceous; scales of the involucre loose (either numerous or few); the inner very narrowly linear, acute; pappus white.—A span high: perhaps a distinct species, connecting the Amelli with the Alpigenous Asters.

38. *A. ericoides*, β. *villosus*. Add syn. A. pauciflorus, ***Martens! in bull. acad. Brux.*** 8 (1841), *p.* 67.—The A. ericoides, *Schkuhr*, ***handb. t.*** 245, is a good representation of A. multiflorus.

71 (*a*). *A. anomalus* (Engelmann! mss.): more or less cinereous-pubescent; stem simple or racemosely branched above, the branches erect-spreading; leaves ovate or ovate-lanceolate, entire, acumiate; the radical and cauline cordate, on slender naked petioles (rarely somewhat serrate); those of the flowering branches lanceolate, subsessile; scales of the hemispherical involucre numerous, imbricated in several series, appressed at the base, with linear elongated and squarrose tips; achenia glabrous.

On limestone rocks, the brink of precipices, &c., in Illinois and Missouri, not uncommon, *Dr. Engelmann!* Sept.–Oct.—A most remarkable species, with nearly the foliage of Aster Shortii; while the heads and involucre much resemble those of A. oblongifolius, being equally squarrose, but rather smaller, and scarcely glandular or granular.

79. *A. reticulatus* (Pursh) should doubtless be stricken out, and the synonym referred to Diplopappus obovatus, *p.* 184.

106. *A. glacialis* (Nutt.)—Defiles of the Wind River Chain of the Rocky Mountains, and also just below the snow-line, *Lieut. Fremont!*—The latter specimens are only about two inches high, more pubescent; the leaves chiefly radical, short, and spatulate; and the involucre quite villous in a young state.—With the above, Lieut. Fremont also collected a specimen of A. Andinus, *Nutt.*, A. integrifolius, *Nutt.*, &c.

107. *A. salsuginosus* (Richards.)—Wind River Chain of the Rocky Mountains, above 7000 feet, *Lieut. Fremont!* Both var. *a.* & *β.* (Leaves varying from linear-lanceolate to spatulate-oblong: rays showy, violet-purple), and,

γ. scaposus: cæspitose, dwarf; scape slightly exceeding the obovate-oblong radical leaves, naked, or with a few bracts, bearing a single head.—Probably gathered near the snow-line.

110. *A. graminifolius* (Pursh).—New Hampshire, *Mr. Eddy!* in *herb. Tuckerman.*

116. *A.* (*Orthomeris*) *glaucus*.—Wind River Chain of the Rocky Mountains, at the elevation of 7000 feet or more, *Lieut. Fremont!*—A close congener of A. elegans (of which Lieut. Fremont gathered a single specimen near the same locality!): rays several, small: achenia slightly hairy.

121. *A.* (*Oxytripolium*) *angustus*.—Saline swampy margin of the Lake of the Woods, and of Devil's Lake, *Mr. Nicollet!*

SOLIDAGO, *p.* 195.

23. *S. humilis*, β.—Abundant in the *Notch* of the White Mountains of New Hampshire! (where it was first collected by *Mr. Tuckerman!*) Near the Willey house, several specimens of this plant, and also of S. altissima, were collected with greenish-white or cream-colored rays!

24. *S. Virga-Aurea*, γ. *multiradiata*.—Wind River Chain of the Rocky Mountains, from 7000 feet in elevation to near the snow-line, *Lieut. Fre-*

mont!—Two states were collected; the one connecting this variety with var. minuta and var. alpina; the other larger, with a stout glabrous stem.

25. *S. thyrsoidea.*—Abundant in woods from the base of the *Notch* to the alpine region of the White Mountains of New Hampshire. and also sparingly found on the exposed alpine summits, far above the limit of trees! Also *Indian Pass*, and sides of Mount Marcy, Northern New York, *Mr. Macrae!* Plant 1–3 feet high, mostly with an elongated virgate or thyrsoid leafy raceme.—Add syn. S. Virgaurea, *Pursh! fl.* 2. *p.* 542. (Labrador, *Kohlmeister!*)

26. *S. glomerata* (Michx.).—Our plant is certainly the species of Michaux, the specimen of his herbarium having been compared with ours by Mr. Decaisne. The state with a strict glomerate inflorescence, as described by Michaux, has recently been collected on the Black Mountain, North Carolina, by Mr. Buckley.

31. *S. Riddellii.*—Add syn. S. amplexicaulis, *Martens! in bull. acad. Brux.* 8 (1841), *p.* 66.

39. *S. neglecta*, is not found in N. Carolina; the specimens received from thence prove to have been collected in Massachusetts. It extends northward to Montreal, *Mr. Macrae!*

40. *S. patula.*—The phrase 'leaves very scabrous above,' was accidentally omitted in the specific character.

49. *S. amplexicaulis.*—The reference to Martens under this remarkable species must be erased, his S. amplexicaulis being S. Riddellii, as above noted.

SILPHIUM, *p.* 274.

3. *S. pinnatifidum* (Ell.) must be reduced to a variety (*β. pinnatifidum*) of S. terebinthinaceum; Mr. Sullivant having noticed that they pass into each other, as we suspected, like the varying forms of S. compositum. In specimens from Alabama, collected by Mr. Buckley, the leaves vary from sinuate-toothed to somewhat bipinnatifid.

IVA, *p.* 286.

4. *I. microcephala.*—Middle Florida, *Dr. Chapman!*—Heads larger than in the original description, 6–8-flowered. Leaves filiform-linear, often an inch long, with smaller ones fascicled in their axils, punctate, and, like the branches, &c. sparsely strigose with minute hairs.

HELIANTHUS, *p.* 318.

13. *H. occidentalis* (Riddell).—Add var.

γ. Dowellianus: nearly smooth and glabrous; stem often stout (2–5 feet high) and more leafy, simple or corymbose-paniculate at the summit; leaves larger, varying from broadly ovate, or even slightly cordate, to oval-oblong.—H. Dowellianus, *M. A. Curtis! in Sill. jour.* 44. *p.* 82.

Around Franklin, Macon County, North Carolina, *Mr. Curtis! Mr. Buckley!* with var. *β.*, which connects it to the ordinary state of the species.—Limb of the lower leaves 3–6 inches in length, 2–5 broad, rather coriaceous, in outline, &c., resembling those of some forms of H. atrorubens. Heads and flowers as in the ordinary form of the species.

Index
of Genera,
contained in the 2d. Volume
of Torrey & Gray's
Flora of North America.

Made out by C. W. Short,
and presented
with grateful acknowledgments,
and sincere regard,
to
George Engelmann, M. D.
St. Louis,

Dec.r 12.th 1850.

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C. W. Short,
Louisville, Ky.
Decr. 12th 1850.

Aster, Lin

Species Bor. Amer.

The numbers are those of Torr. & Gr. Fl.

A. abbreviatus Nees Torr. & Gr. Fl. no 83

acuminatus Mich. F.G. 111

adnatus Nutt F.G. 21

adscendens Lindl F.G. 14

adulterinus Willd F.G. 94

aestivus Mill 87 = 50 fide Porter M. Cl. 57 = 60 fide Gray Man. Capitata

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alpinus Lin F.G. 103.

altissimus Mill 63

amethystinus Nutt 69

ansenus Lam 63

amplexicaulis Lam 70 Muhl. Cat. 23

amplus Lindl 58

amygdalinus Lam = Diplop. am. Michx = Diplop. umbell.

Andersonii Gray Am. Ac. 7. 352 Wilson Bot. King. 143

andinus Nutt. 105 = glaricalis fide Wilson B. King

angustus Torr & Gr. 121 Nees 51

anomalus Ling. Torr & Gr. app. p. 503

arenarioides DC Coult. = Gr. Am. Ac. 8. 647 (Crigon Cat. Bot. King

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azureus Lindl 27

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biennis Torr 39

biflorus Mich 4

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Bigelovii Gray N. Wilk. 91 t. 10

blandus Nutt 75

blepharophyllus Gray N. Wright 2. 77

Blooneri Gray Am Ac. 6. 539

bracteolatus Nutt 43. 420

brumalis Nees 92

Campestris Nutt. 42

canescens Nutt = Mad: creatura

carneus Nees 52

carolinianus Walt 67

Chapmani Torr & Gr. 119

Chilensis Nees 15 Durandii is a better name for 874

ciliatus Will 80 Nutt. 17

ciliolatus Lindl 37 Muhl. 39

coerulescens Dt. 72

concinnus Willd. 25

concolor Lin 18

confertus Nees 98

conspicuus Lindl 6

conyzoides Willd. = Sonchocarpus

cordifolius Lin 31

coridifolius Willd. 38 - pl. Hook 45 - Mx 46

cornifolius Muhl = Diplopappus

Cornuti Went. 84

corymbosus Ait 1

Curtisii Torr & Gr. 11

cyaneus Hoffm. 23. Ell. 25

denudatus Nutt 415

diffusus Ait 48 var III

divaricatus Nutt 123 Lin 1 & Diplop. cornifolius

divergens Ait. 48
diversifolius Mich 29
Douglasii Lindl 59
dracunculoides Willd 51. var
Drummondii Lindl 33 - 32 var
dumosus Lin 46 Hoffm. 38 DC 39
Durandii Gray 1874 for Chilensis Nees 15

elegans Torr & Gr. 115 Willd 7
Elliottii Torr & Gr. 62
elodes Torr & Gr. 56 = Salicifolius fide G
= Congifolius
eminens Willd 61
Engelmanni Gray Sill Jour N.S. 33. p. 9
var of elegans fide E
ericoides Lin 38
eryngiifolius Torr & Gr. app. p. 502
Espenbergensis Nees 57
exilis Ell. 125
exscapus Richards. = Townsendii sericea

falcatus Lindl 40 see Porter H. Colorad
Fendleri Gray Pl. Fend. 66 = A Nuttallii Tr
fide Gr. Pl. Wr
firmus Nees 63 var
flexuosus Nutt 120

floribundus Willd 57
foliaceus Lindl 109
foliolosus Ell Nutt. 46 - Ait 46 & 88
fragilis Willd. 47 var
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Herveyi Gray Man. 1870. p. 229
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hirtellus Lindl 35
hispidus Lam 63
horizontalis Desf 48 var
humilis Pursh = Diplopapp. cornifol. = Willd = D. amygd.
hyssopifolius Lin = Galatella

infirmus Mich = Diplopapp. cornifol
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Kingii Watson, Bot. King. p141 t.16

laevigatus Willd 23 Pursh 57 ?
laevis Lin 23
Lamarckianus Nees. 49
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laxifolius Nees 60 = aestivus Ait 81 fide Gray ms
laxus Willd 54 = 61 longifolius, fide Gr Man
leucanthemus Desf 51 var
Lindleyanus Torr & Gr 36
linariifolius Lin = Diplopappus
linifolius Lin 122 (see Gray Anna. 8. 647)
longifolius Lam 61 (= salicifolius fide Gr
lutescens Torr & Gr 118

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Menziesii Lindl 19
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mirabilis Torr & Gr 130
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multiceps Lindl 73
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praecox Willd 82 Lindl 36 var
prenanthoides Muhl 64
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ramulosus β Lindl 39. Nutt 41
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Spreng. 90
reticulatus Pursh 79
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Aiton 50 Darlington 50. Aiton 55. Richardson 60

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Sayi Nutt in Gray Pl. Hall Am. Ac. 8. 389. 7. 9. 71 var.

scaber Ell 29

scandens Jacq. 67.

scaposus Torr & Gr. King Bot. 143

Schreberi Nees 2

scoparius DC 77 (= 39)

secundiflorus Desf. 48 var

sericeus Vent. 16

serotinus Willd 57 = part.

Shastensis (mechaeranthera) Gray Am. Ac. 6. 539

Shortii Hook 28

simplex Willd 50

solidagineus Michx Lericscarpus

Sonorae Gray Pl. Wright 2. 76

sparsiflorus Mx 38 Nutt 46 Willd 46 = pt Pursh 12

spathulatus Lindl 13

speciosus Horn 7.

spectabilis Ait. 7 Willd 90

spinosus Benth. 129

spinulosus Chapm. Fl. S. St. 199

spurius Willd 70

squarrosus Walt 20

squarrulosus Nees 90

stenophyllus Lindl 85

strictus Poir 99 Pursh 4

subasper Lindl 52 var.

subspicatus Nees 74

subulatus Mx. 122 (best name for linifolius)

surculosus Mx 9. Ell 7. 8.

tardiflorus Lin Nees 95

tenuifolius Lin 51. (see Gray Am. Ac. 8. 647)

thyrsiflorus Hoffm. 89. = 61 fide Gray Man

Tilesii Nees 108

tortifolius Gray Am. Ac. 7. (1868) 363 Aplopappus Townsendii

Tradescanti Lin 47. Nees 49

Tripolium Walt 120

turbinellus Lindl 26

Unalashkensis Less. 107 Hook...

umbellatus Mill = Diplopapp. amygdalinus

undulatus Lin. H. Cliff. Ait. 29 — Lin spec 2

uniflorus Michx 112

uvophyllus Link. 34 (= 32 ?)

versicolor Willd 97

villosus Mx 28 var

viminens Lam 47 Link. in pl. 63

virgatus Ell 24 Nees 55

virgineus Nees 61

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xylorhiza Torr. Gr. 113

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} Field Jackson. Journ Bot. 1893. 298

See also

Journ. Arnold Arboretum

2: 183. 1921